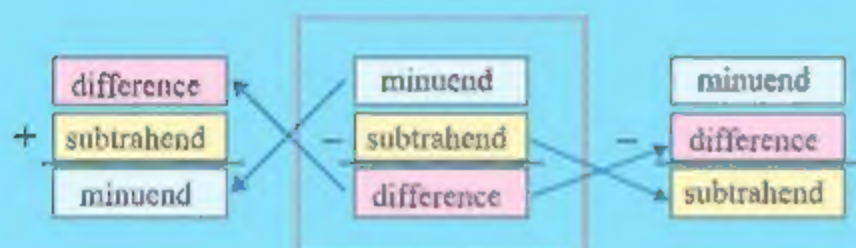


# Elementary Mathematics

## Class Four



Oh, 3 is the **common factor** of 15 and 18!

$$\frac{15}{18} = \frac{5}{6}$$

(Note: Red arrows indicate dividing both numerator and denominator by 3.)

$$\frac{5}{6}$$

We can do like this as a simple method.



National Curriculum and Textbook Board, Bangladesh

Prescribed by the National Curriculum and Textbook Board  
as a textbook for class four from the academic year 2013

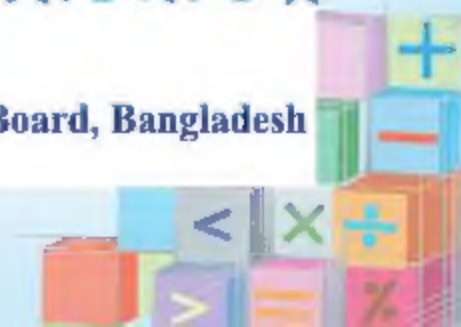
# Elementary Mathematics

## Class Four

Revised for the academic year 2025



National Curriculum and Textbook Board, Bangladesh





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## Preface

Primary level constructs the foundation of education. A set of well-defined targets and properly planned primary education provide strengths to the entire education system. Keeping this in mind, the primary level has been given supreme importance in the Education Policy 2010. Increasing the span and inclusiveness of the primary level, as the developed countries of the world, have been emphasised. Special attention has been given to ensure that no child's access to education is hindered by social and economic status, religion, ethnicity, or gender identity.

The National Curriculum and Textbook Board (NCTB) has implemented an integrated curriculum to update primary education. While this curriculum trails the pedagogy and the curriculum of developed countries, it also adopts traditional teaching-learning values of Bangladesh at the same time. This has enabled the education to be more life-oriented and productive. In the context of globalisation, the mental health of the children has also been specially considered in this curriculum.

Textbook is the most important component of curriculum implementation. NCTB has always borne that in mind while designing textbooks for all levels and classes including primary level. Curriculum goals and objectives have been prioritised in the writing and editing of each book. A keen eye has been kept on the diverse curiosity and capacity of the child's mind. Special importance has been given in designing the curriculum and the textbooks to make teaching-learning interactive and enjoyable. It is hoped that each book will help in the balanced psycho-physical development of children through educational activities. It will support in acquiring the required skills, adaptability, patriotism and moral values at the same time.

Elementary mathematics is a compulsory subject. Explanation, examples and pictures are used to present the content in an easy and simple way for the children. The "Let us do" activities have been incorporated along with examples to create interest among learners and make learning easier. Moreover, the contents of the textbook have been rearranged following the order of easy to hard. There is enough scope for practice in this textbook.

Special thanks to the specialists and teachers who worked intensively in writing, editing and revising the textbook. Thanks to those also who have made the textbook attractive to children through its design and illustration. This textbook, written under the curriculum 2012, has been revised to address the need in the changed context of 2024. Due to time constraints, some errors may still exist. Any constructive advice and guidance from the audience will be considered with due importance.

At the end, I wish every success of the learners for whom the book has been produced.

October 2024

**Professor Dr. A K M Reazul Hassan**

Chairman

National Curriculum & Textbook Board, Bangladesh





## Explanation of Characters and Symbols:

- 1) Character: A dialogue between two students named Reza and Meena is shown in the textbook. The mathematical concept of the students would be clear through their discussion and opinion.



Reza



Meena

- 2) The steps have been indicated by using some symbols in the lesson.



**Key Question:** Key concept of the chapter has been expressed through this question.



**Activity:** To solve a problem students will discuss and think logically with the help of teacher.




**Exercise:** Students will solve the problems. Progress of learning can also be assessed.





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## Chapter One

# Large Numbers and Place Value



How do we count, read and write large numbers?



Let's think how we count large number.

Why don't we make groups of ten, hundred and thousand as we learned in Grade 2 and 3?

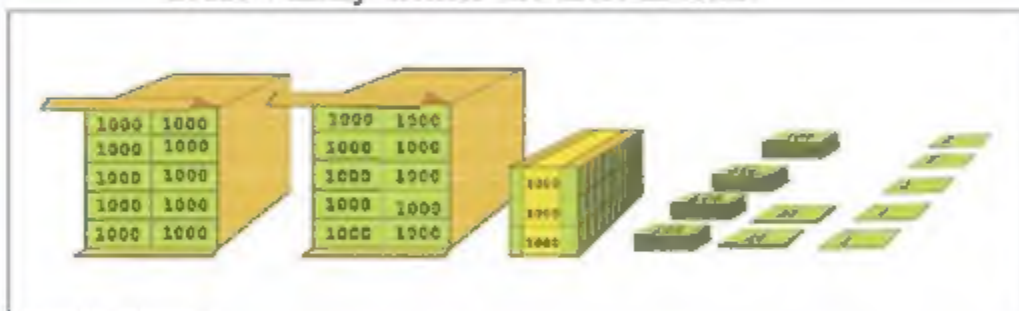


## 1.1 Five digit numbers



These are tickets to sell for a cricket match.

1. How many packages does the box have inside?
2. How many tickets are there in total?



1000	1000
1000	1000
1000	1000
1000	1000
1000	1000

= 10000  
ten thousand.

The box has 10 packages of 1000. It means the box has '10 times 1000' tickets. This amount is called **ten thousand** and is written as **10000**. There are 2 ten thousands, so it is called **twenty thousand**.



And we have 3425 more tickets, so the total is...



The total is: **23425**



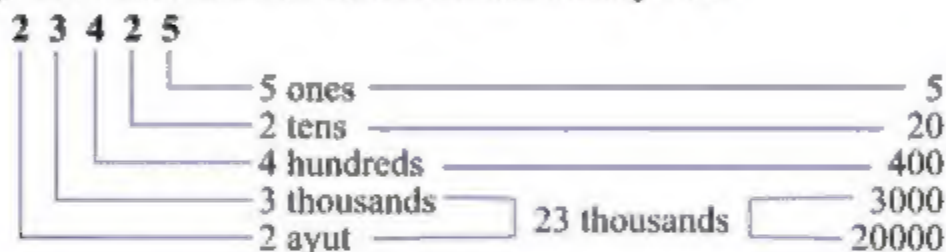
And this new place is called **ayut**.

Name of the Place

10000 10000 10000	1000 1000 1000	100 100 100 100	10 10	1 1 1 1 1
<b>ayuts</b>	thousands	hundreds	tens	ones
<b>2</b>	<b>3</b>	<b>4</b>	<b>2</b>	<b>5</b>
twenty-three thousand	four hundred	twenty-five		

We read **23425** as:

'twenty tree thousand four hundred and twenty five.'

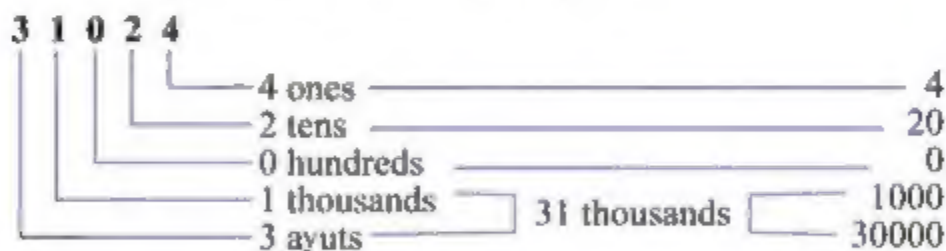


**1** Read aloud, write in words and show place value like above.

(1) 23517    (2) 50326    (3) 93005

This is an example :

31024 'Thirty one thousand and twenty four'



**2** Write in figures.

- (1) fifty seven thousand three hundred and sixty three
- (2) thirty thousand six hundred and five
- (3) eighty six thousand and two
- (4) the number made of 4 ten thousands and 9 thousands
- (5) the number made of 6 ten thousands, 7 thousands and 5 tens





## 1.2 Six, Seven and Eight digit numbers



**137109**

This is the number of a newly registered motor vehicle in Bangladesh in 2013. How do you read it?



It's easy! Let's make groups of ten, hundred thousand and ten thousand as we did before.



Wait! I don't think it's so easy... because there aren't enough places.

	ayuts	thousands	hundreds	tens	ones
1	3	7	1	0	9

You need to know a new place named **lacs**.

1 lac is 10 ayut and written as 100000

Name  
of the  
Place

lacs	ayuts	thousands	hundreds	tens	ones
1	3	7	1	0	9
one lac	thirty seven thousand	one hundred	nine		

We read **137109** as:

**'one lac thirty-seven thousand one hundred and nine.'**

1	3	7	1	0	9						
						9 ones					9
						0 tens					0
						1 hundreds					100
						7 thousands					7000
						3 ayuts	37 thousands				30000
						1 lacs					100000



**1** Read the numbers aloud, write in words and show place value.

(1) 894312 (2) 360518 (3) 730084 (4) 2463751

Challenge!

Reza, can you guess how to read **2463751**, in **1** (4)?



Another place is needed, and I think the number which comes to this place is called ten lacs...?



As Reza guesses, **ten lacs** comes to this place.  
1 **ten lac** is written as **1000000**

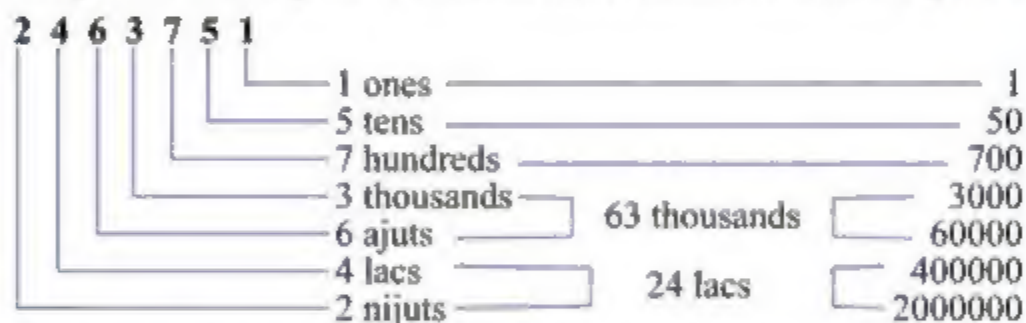
And this new place is called **nijut**.

Name  
of the  
Place

nijuts	lacs	ayuts	thousands	hundreds	tens	ones
2	4	6	3	7	5	1
twenty-four lac		sixty-three thousand		seven hundred	fifty-one	

We read **2463751** as:

**'twenty four lac sixty three thousand seven hundred and fifty one.'**



**One nijut (ten lacs) is called 'one million' as well.**



**2** Read aloud and write in words. Show their place value like above.

(1) 4123476 (2) 6871035 (3) 5609320 (4) 1111111



**3** Write in figures.

- (1) five lac seventy three thousand six hundred and thirty four
- (2) thirty one lac forty five thousand nine hundred and thirty six.
- (3) ninety nine lac ninety nine thousand nine hundred and ninety nine
- (4) the number made of 7 lacs and 3 ten thousands
- (5) the number made of 4 ten lacs 8 thousands and 3 hundreds



1 crore is 10 nijut, and written as 10000000

Name of the Place	crores	nijuts	lacs	ayuts	thousands	hundreds	tens	ones
	1	9	5	8	4	9	7	2
	one crore	ninety five lac		eighty four thousand		nine hundred	seventy two	

**'one crore ninety five lac eighty four thousand nine hundred and seventy two.'**

1 9 5 8 4 9 7 2

2 ones \_\_\_\_\_ 2

7 tens \_\_\_\_\_ 70

9 hundreds \_\_\_\_\_ 900


4 thousands \_\_\_\_\_ 4000

8 ayuts \_\_\_\_\_ 80000

5 laes \_\_\_\_\_ 500000

9 nijuts \_\_\_\_\_ 9000000

1 crore \_\_\_\_\_ 10000000

- 4  1. Read aloud, write in words and show place value like above  
(1) 19584972                      (2) 25007024
2. Write in figures.
- (1) one crore twelve lac thirteen thousand six hundred and eighteen
- (2) two crore two lac two thousand two



### Use of 'comma'

As you might have found, we often face difficulty in counting large numbers. So we use 'comma' to read the figures of the number easily.



How to put comma

[Example]

7, 5 3, 6 5, 7 8 0

2 digits 2 digits 3 digits



crores	tens	lacs	thousands	hundreds	tens	ones
7	5	3	6	5	7	8
seven crore	fifty-three lac	sixty-five thousand	seven hundred	eighty		

Each comma comes after the place of **thousands**, **lacs** and **crores**.

Each comma helps us to understand the places of numbers.



5

Put commas at the right place on the number and read them aloud

(1) 98784689

(2) 6825712

(3) 130405

(4) 70004

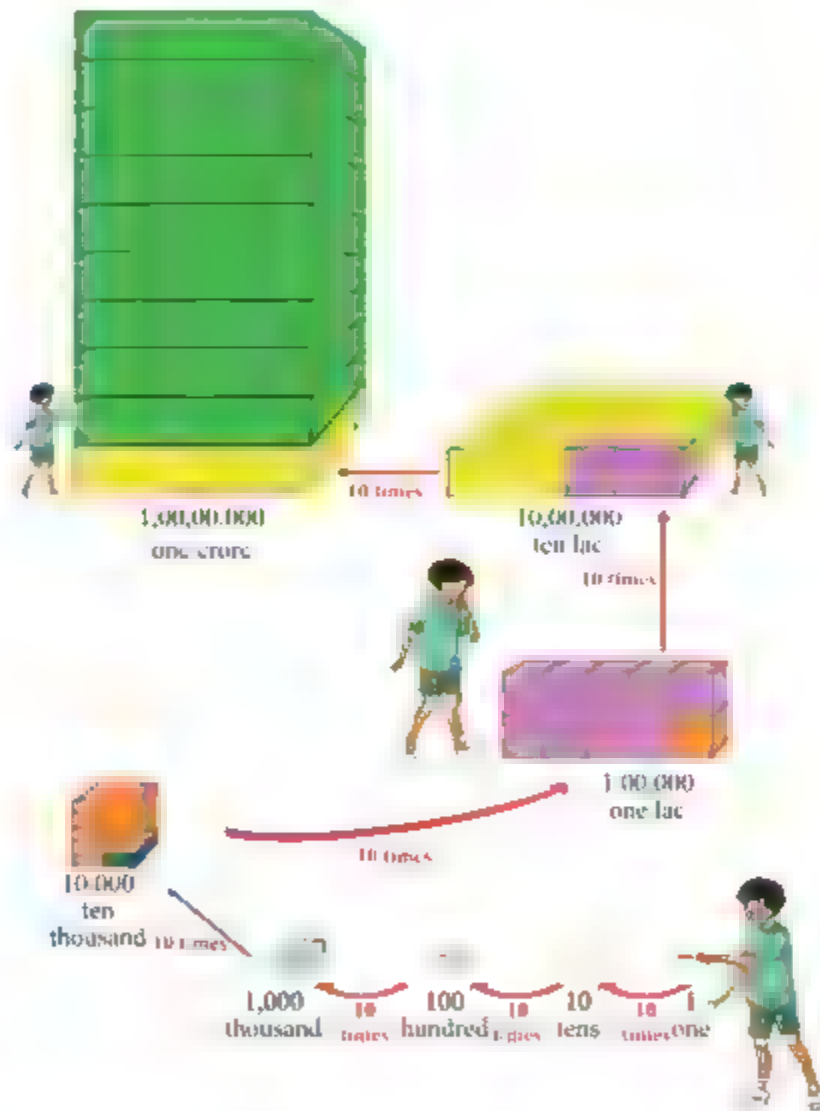
(5) 2171

(6) 44444444



Let's summarise the number counting system for larger numbers.

Explain this picture.

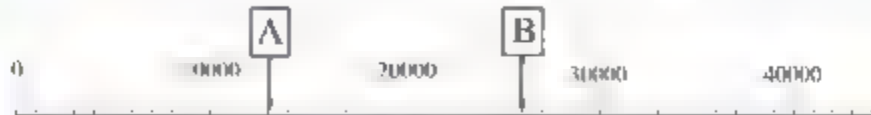


- (1) How many times is ten thousand larger than one thousand?
- (2) How many times is one lac larger than ten thousand?
- (3) How many times is one crore larger than ten lac?

## 1.3 Number Line



What numbers are indicated by A and B on the number line?



Number line is very useful to know the numerical sequence and larger-smaller relation between numbers.

The numbers increase as you go to the right on the number line. And we must be aware of the each interval of the ruler scale.

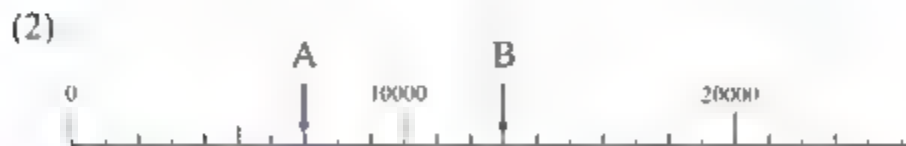
In this case, each interval of the ruler scale is 1000.



A is 3 intervals after 10000 :  $10000 + 3000 =$

B is 6 intervals after 20000 :  $20000 + 6000 =$

1 ? Write the numbers that correspond with the positions of A, B and C.





2 Place the numbers on the number line.

(1) 4000, 16000, 29000



(2) 30000, 300000



(3) 72000, 80000, 89000



## 1.4 Exercise (1)

1. Read aloud, write in words and show the place value.

(1) 872931      (2) 5178572      (3) 13572468      (4) 1010101

2. Write these numbers in both figures and words.

(1) The number made of 45 thousands

(2) The number made of 100 lacs

(3) The number made of 1000 thousands

(4) The number made of 127 thousands

(5) The number made of 10 lacs, 10 thousands, 10 hundred and 10

They look so complicated!



Draw place value table on your notebook and using the table form numbers.

crores	nijuts	lacs	ajuts	thousands	hundreds	tens	ones



3 Read these numbers aloud and put the digit at the right place according to the following example.

(Ex.) 48639

nijuts	
lacs	
ayuts	4
thousands	8
hundreds	6
tens	3
ones	9

(1) 402537

nijuts	
lacs	
ayuts	
thousands	
hundreds	
tens	
ones	

(2) 7080399

nijuts	
lacs	
ayuts	
thousands	
hundreds	
tens	
ones	

4. Put comma in appropriate position .

(1) 13524689    (2) 9757834    (3) 55555555

5. (1) Put the numbers at the positions from (A) to (C).



(2) Put the numbers at the positions from (A) to (D).



## 1.5 Comparison of Numbers



Which number is larger?



Which one is larger, 38000 or 36000?

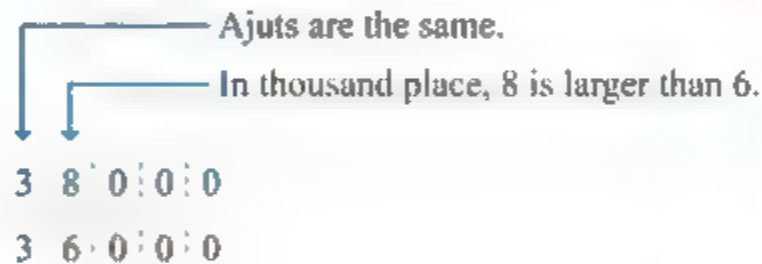


I remember we learned comparison of four digit number in Grade 3.

Which should we compare from the biggest place or the smallest place?



We compare from the biggest place to the smallest one by one

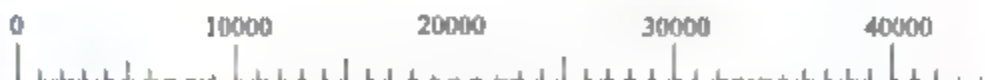


So, 38000 is larger than 36000.

$$38000 > 36000$$



Let's check 38000 and 36000 on the number line



1. Compare the following numbers and fill in the blanks with '<' or '>'

(A) 9530  9628      (B) 24800  23900

(C) 75000      80000      (D) 465311      465211



## Large Numbers and Place Value



Which number is larger, **39000** or **371020**?



Let's compare the digits from the biggest place to the smallest! So, I think 39000 is larger than 371020

Wait! We sometimes misread large numbers. Let's put the numbers on the place properly or put comma.



3	9	0	0	0	
3	7	1	0	2	0

39,000    3,71,020



Wow! The number of digits is different!  
371020 is clearly greater than 39000!

$$39000 < 371020$$

Let's put the numbers on the number line to compare their numerical size



### The way of Comparison of Numbers

1. Compare the number of digits.

The number consisting of more digits is larger.

2. When the number of digits is the same:

- (1) Compare the biggest place

The number which has bigger number is larger

- (2) If they are the same, compare the second biggest place, and repeat this comparison to the smaller digit until you find the difference

- (3) If all digits are the same, these two numbers are the same

2. Compare the following numbers and put '<' or '>' in the boxes.

(1) 87526  141632

(2) 9999  44444

(3) 4467322  464499

(4) 1000456  1000465



Sakib wants to buy a bicycle and finds different prices in different shops. They are taka 5238, taka 7329, taka 8324, taka 6137 and taka 7325.

Which one is the cheapest and which one is the most expensive? Let us arrange these numbers from the smallest to the greatest sequentially and show them by symbols.

5238

7329

8324

6137

7325



Well, all are four digit numbers. So let's begin with comparing the digits of the biggest place.

How about putting comma to clarify the places?

5,238

7,329

6,137

8,324

7,325

Let us arrange them vertically in order to compare the numerical size.



5 2 3 8

7 3 2 9

8 3 2 4

6 1 3 7

7 3 2 5

What is the smallest number?

What is the second smallest number?

By observing the numbers with the place value, we get.

$$5238 < 6137 < 7325 < 7329 < 8324$$

smallest

largest

We can also arrange these numbers from the largest to the smallest

$$8324 > 7329 > 7325 > 6137 > 5238$$


So which price should Sakib prefer?

## Large Numbers and Place Value

- 3 ? Arrange the following numbers serially from smaller to greater and from greater to smaller and show them by symbols.

98427, 56789, 603245, 791345, 6750283, 97653, 891498

Firstly, it would be better to put them vertically, and compare them



Which is more convenient, putting comma or putting numbers vertically?


Smaller to greater

	<		<		<		<		<		<	
--	---	--	---	--	---	--	---	--	---	--	---	--

Greater to smaller

	>		>		>		>		>		>	
--	---	--	---	--	---	--	---	--	---	--	---	--



Prepare four number cards as the following picture and make four digit numbers as many as possible with them And write all of them down on your note book.

By arranging cards, let's form the numbers.



7	4	9	1
9	7	1	4
1	9	4	7

7	4	9	1
---	---	---	---



What is the largest number that you can make with these four cards?

And what is the smallest number that you can make with them?

The largest number is: 9741

The smallest number is: 1479

Are there any rules to make the largest or the smallest number?



Let's exchange our opinion about it and find the rules.



Imagine that you have the following five number cards. Now make five digit numbers with them.

8 5 0 2 7

- (1) Using all five cards, make the largest five digit number possible.
- (2) Using all five cards, make the smallest five digit number possible.

We must be careful about the use of '0'.



Oh, that's right '0' cannot be put in all the places.



The largest number is: 87520

The smallest number is: 20578

Let's listen to the opinion of other students, exchange our opinion about it and find the rules.



Rita

To make the largest number, we put the highest digit at the beginning, and put the second highest digit at the second place.

Yes, of course. And in this way, the digits are arranged from larger to smaller.  $\underline{9741} \rightarrow \underline{87520}$

Sohel





Simma

On the other hand, to make the smallest number, we put the smallest digit at the beginning, and the second smallest digit in the second place. As a result, the digits are arranged from smaller to larger. 1479

But, we must be careful about '0'. Even though '0' is the smallest digit, it cannot be put at the beginning of the number because no number begins with '0'. So we have to put '0' at the second place instead of beginning

× 02578 ✓ 20578



Sobuj

We have found some important rules of the structure of numbers.

- 4 You have the following six number cards. Now make six digit numbers with all of them.

Oh, what were odd number and even number ?

0 1 3 4 7 9



Challenge!

- (1) Make the largest number possible.
- (2) Make the smallest number possible.
- (3) Make the largest **odd** number possible.
- (4) Make the smallest **even** number possible.



Find the largest and the smallest number in every digit number up to six-digit number and share with your friends what you have found out.

	largest	smallest
one-digit number		1
two-digit number		
three-digit number		
four-digit number		
five-digit number		
six-digit number		

In this case '0' isn't regarded as one-digit number because it is mathematically very special

- (1) What is the number next to 999?
- (2) What is the number before 10000?

## 1.7 Exercise(2)

1. Compare the following numbers and put '<', '>' or '='.

(1) 8499  8511      (2) 11100  11001

(3) 289999  290001      (4) 2222221  2222223

(5) 1011001  1011001      (6) 5555555  555555

2. Using the following six number cards, make six digit numbers.

0 2 9 6 8 4

- (1) Make the largest number possible.
- (2) Make the smallest number possible.
- (3) Make the largest **odd** number possible.
- (4) Make the smallest **odd** number possible.

3. This is the list of the population of some cities. Arrange these numbers from smaller to larger sequentially and answer which city has the largest population and which has the smallest.

Name of the city	Population
A	371993
B	2456891
C	3704231
D	4589476
E	886397

## Chapter Two

# Addition and Subtraction

### 2.1 Addition upto four digit numbers



Add

(1)  $232 + 334$

(2)  $1325 + 3522$

(3) 
$$\begin{array}{r} 253 \\ + 526 \\ \hline \end{array}$$

(4) 
$$\begin{array}{r} 1538 \\ + 3421 \\ \hline \end{array}$$

(5) 
$$\begin{array}{r} 1231 \\ 103 \\ + 6254 \\ \hline \end{array}$$

(6) 
$$\begin{array}{r} 1402 \\ 3056 \\ 210 \\ + 3120 \\ \hline \end{array}$$

(7)  $116 + 228$

(8)  $2416 + 1375$

(9) 
$$\begin{array}{r} 364 \\ + 472 \\ \hline \end{array}$$

(10) 
$$\begin{array}{r} 1538 \\ + 3625 \\ \hline \end{array}$$

(11) 
$$\begin{array}{r} 4391 \\ 1584 \\ + 3625 \\ \hline \end{array}$$

(12) 
$$\begin{array}{r} 148 \\ 1275 \\ 2151 \\ + 1362 \\ \hline \end{array}$$



We add ones place first and add tens, hundreds and thousands in order, don't we?

Yes, and we recall how to carry the numbers



$$\begin{array}{r} 121 \\ 1373 \\ 4584 \\ + 3655 \\ \hline 9612 \end{array}$$

ones place  $3 + 4 + 5 = 12$

tens place  $7 + 8 + 5 + 1 = 21$

hundreds place  $3 + 5 + 6 + 2 = 16$

thousands place  $1 + 4 + 3 + 1 = 9$



## 2.2 Addition up to five digit numbers



Let's try addition with larger numbers.



In a city there live 45736 females and 48797 males. How many people are there in total?



Here, we'll have to find the total number, so the operation will be .

Mathematical sentence is:  $45736 + 48797$

Let's put them up-down and add them.

$$\begin{array}{r} 45736 \\ + 48797 \\ \hline 94533 \end{array}$$

ones place	$6 + 7$	$= 13$
tens place	$3 + 9 + 1$	$= 13$
hundreds place	$7 + 7 + 1$	$= 15$
thousands place	$5 + 8 + 1$	$= 14$
ajuts place	$4 + 4 + 1$	$= 9$

Even though the numbers are bigger, the way of addition is the same as we studied in grade 3!

The number of total population is: 94533



1 Add.

- |   |   |   |   |
|---|---|---|---|
| (1) $\begin{array}{r} 13567 \\ + 43121 \\ \hline \end{array}$ | (2) $\begin{array}{r} 22643 \\ + 1725 \\ \hline \end{array}$  | (3) $\begin{array}{r} 23514 \\ + 15627 \\ \hline \end{array}$ | (4) $\begin{array}{r} 13137 \\ + 18672 \\ \hline \end{array}$         |
| (5) $\begin{array}{r} 22679 \\ + 57122 \\ \hline \end{array}$ | (6) $\begin{array}{r} 23836 \\ + 41489 \\ \hline \end{array}$ | (7) $\begin{array}{r} 43756 \\ + 37275 \\ \hline \end{array}$ | (8) $\begin{array}{r} 99999 \\ + \quad \quad 1 \\ \hline \end{array}$ |



The following table lists the sales of a candy shop  
How much is the total sale from  
January to May?

January	Tk.34295
February	Tk 13720
March	Tk.14853
April	Tk 20582
May	Tk.12376



As we want to find out the total amount, so the operation will be .

Mathematical sentence is:  $34295 + 13720 + 14853 + 20582 + 12376$

$$\begin{array}{r}
 34295 \\
 13720 \\
 14853 \\
 20582 \\
 + 12376 \\
 \hline
 95826
 \end{array}$$

ones place  $5 + 0 + 3 + 2 + 6 = 16$

tens place  $9 + 2 + 5 + 8 + 7 + 1 = 32$

hundreds place  $2 + 7 + 8 + 5 + 3 + 3 = 28$

thousands place  $4 + 3 + 4 + 0 + 2 + 2 = 15$

ajuts place  $3 + 1 + 1 + 2 + 1 + 1 = 9$

The total is Tk. 95826

The way of addition is basically the same. But here the numbers we carry are larger.



2 Add

(1)

$$\begin{array}{r}
 3123 \\
 1434 \\
 + 4272 \\
 \hline
 \end{array}$$

(2)

$$\begin{array}{r}
 5364 \\
 2103 \\
 1134 \\
 + 3225 \\
 \hline
 \end{array}$$

(3)

$$\begin{array}{r}
 1082 \\
 183 \\
 1427 \\
 + 6214 \\
 \hline
 \end{array}$$

(4)

$$\begin{array}{r}
 13921 \\
 12503 \\
 33555 \\
 11502 \\
 + 20516 \\
 \hline
 \end{array}$$



Now, we can do the vertical calculations of big numbers.

## 3 Add

(1)  $1112 + 2221 + 3232 + 2222$  (2)  $50000 + 4000 + 300 + 20 + 1$

(3)  $123 + 321 + 4000 + 2222 + 3333$

(4)  $12311 + 21022 + 11111 + 22222 + 21212$

(5)  

$$\begin{array}{r} 2513 \\ 1242 \\ + 5234 \\ \hline \end{array}$$

(6)  

$$\begin{array}{r} 1432 \\ 2104 \\ 1735 \\ + 2621 \\ \hline \end{array}$$

(7)  

$$\begin{array}{r} 1232 \\ 103 \\ 328 \\ + 6254 \\ \hline \end{array}$$

(8)  

$$\begin{array}{r} 1402 \\ 3050 \\ 4637 \\ 2210 \\ + 3126 \\ \hline \end{array}$$

(9)  

$$\begin{array}{r} 329 \\ + 54672 \\ \hline \end{array}$$

(10)  

$$\begin{array}{r} 54827 \\ + 2654 \\ \hline \end{array}$$

(11)  

$$\begin{array}{r} 43454 \\ + 37647 \\ \hline \end{array}$$

(12)  

$$\begin{array}{r} 99999 \\ + 1 \\ \hline \end{array}$$

(13)  

$$\begin{array}{r} 40305 \\ 15246 \\ + 30837 \\ \hline \end{array}$$

(14)  

$$\begin{array}{r} 25302 \\ 3514 \\ 236 \\ + 34005 \\ \hline \end{array}$$

(15)  

$$\begin{array}{r} 24173 \\ 6234 \\ 2558 \\ + 3424 \\ \hline \end{array}$$

(16)  

$$\begin{array}{r} 32724 \\ 9063 \\ 12626 \\ 21151 \\ + 13312 \\ \hline \end{array}$$

(17)  

$$\begin{array}{r} 32732 \\ 4328 \\ 64350 \\ 2235 \\ + 2827 \\ \hline \end{array}$$

(18)  

$$\begin{array}{r} 13787 \\ 27253 \\ 23856 \\ 16154 \\ + 16353 \\ \hline \end{array}$$

(19)  

$$\begin{array}{r} 21564 \\ 18602 \\ 25678 \\ 21913 \\ + 12243 \\ \hline \end{array}$$

(20)  

$$\begin{array}{r} 9999 \\ 18999 \\ 17999 \\ 19999 \\ + 29999 \\ \hline \end{array}$$

## Addition and Subtraction

In case of sideways calculation, we add one by one from ones place to larger places. Then putting ' ' mark on the top of calculated digit is useful.



Let's solve the example.

$$13421 + 2534 + 40432 + 22020 + 12141$$



(1) ones place

$$1 + 4 + 2 + 0 + 1 = 8$$

$$1342\overset{1}{1} + 253\overset{4}{4} + 4043\overset{2}{2} + 2202\overset{0}{0} + 1214\overset{1}{1} = \boxed{\phantom{00}}\boxed{\phantom{00}}\boxed{\phantom{00}}\boxed{\phantom{00}}\boxed{8}$$

(2) tens place

In case of carrying, add to the next place.

$$1342\overset{1}{1} + 253\overset{4}{4} + 4043\overset{2}{2} + 2202\overset{0}{0} + 1214\overset{1}{1} = \boxed{\phantom{00}}\boxed{\phantom{00}}\boxed{\phantom{00}}\boxed{4}\boxed{8}$$

(3) hundreds place

$$1342\overset{1}{1} + 253\overset{4}{4} + 4043\overset{2}{2} + 2202\overset{0}{0} + 1214\overset{1}{1} = \boxed{\phantom{00}}\boxed{\phantom{00}}\boxed{5}\boxed{4}\boxed{8}$$



Let's try to calculate the rest.

(4) thousands place

$$1342\overset{1}{1} + 253\overset{4}{4} + 4043\overset{2}{2} + 2202\overset{0}{0} + 1214\overset{1}{1} = \boxed{\phantom{00}}\boxed{\phantom{00}}\boxed{5}\boxed{4}\boxed{8}$$

(5) ayuts place

$$1342\overset{1}{1} + 253\overset{4}{4} + 4043\overset{2}{2} + 2202\overset{0}{0} + 1214\overset{1}{1} = \boxed{\phantom{00}}\boxed{\phantom{00}}\boxed{5}\boxed{4}\boxed{8}$$



Do the sideways calculation

(1)  $3242 + 1305 + 132 + 1310$

(2)  $2150 + 3518 + 1310 + 1314 + 1101$

(3)  $24163 + 10425 + 14203 + 2340 + 16025$

(4)  $21403 + 14130 + 10137 + 19025 + 21025$



## Challenge

5 Let's add some five-digit numbers whose sum is 100000.

[1st step] with two numbers

$$\begin{array}{r} + \\ 100000 \end{array}$$



How can I do it? It seems difficult.

Start with ones place  
And make 10 in each  
place including the  
carrying number.



[example]

$$\begin{array}{r} 20000 \\ + 80000 \\ \hline 100000 \end{array}$$

$$\begin{array}{r} 19990 \\ + 80010 \\ \hline 100000 \end{array}$$

$$\begin{array}{r} 14252 \\ + 85748 \\ \hline 100000 \end{array}$$

[2nd step] with three numbers

[example]

$$\begin{array}{r} + \\ 100000 \end{array}$$

$$\begin{array}{r} 33334 \\ 33333 \\ + 33333 \\ \hline 100000 \end{array}$$

$$\begin{array}{r} 12345 \\ 59412 \\ + 28243 \\ \hline 100000 \end{array}$$

[3rd step] with more numbers

[example]

$$\begin{array}{r} + \\ 100000 \end{array}$$

$$\begin{array}{r} 26391 \\ 32582 \\ 19523 \\ + 21504 \\ \hline 100000 \end{array}$$

$$\begin{array}{r} 31865 \\ 21865 \\ 12865 \\ 11865 \\ + 21540 \\ \hline 100000 \end{array}$$

## 2.3 Subtraction up to four digit numbers



Subtract:

(1)  $230 - 110$

(2)  $730 - 210$

(3)  $6760 - 4650$

(4)

$$\begin{array}{r} 597 \\ - 397 \\ \hline \end{array}$$

(5)

$$\begin{array}{r} 987 \\ - 450 \\ \hline \end{array}$$

(6)

$$\begin{array}{r} 2568 \\ - 105 \\ \hline \end{array}$$

(7)

$$\begin{array}{r} 7586 \\ - 3215 \\ \hline \end{array}$$

(8)  $150 - 70$

(9)  $530 - 90$

(10)  $455 - 265$

(11)

$$\begin{array}{r} 540 \\ - 280 \\ \hline \end{array}$$

(12)

$$\begin{array}{r} 453 \\ - 76 \\ \hline \end{array}$$

(13)

$$\begin{array}{r} 3600 \\ - 521 \\ \hline \end{array}$$

(14)

$$\begin{array}{r} 8302 \\ - 4797 \\ \hline \end{array}$$



Let's review how to subtract with 3-digit numbers. We calculate ones place first and subtract in order.

Yes. But be careful about "moving the number."



$$\begin{array}{r} 642 \\ - 368 \\ \hline 4 \end{array}$$

**[Ones place]  $12 - 8 = 4$**

We cannot subtract 8 from 2, so move 1 ten (=10 ones) from tens place to ones place and subtract 8 from 12.

$$\begin{array}{r} 642 \\ - 368 \\ \hline 74 \end{array}$$

**[Tens place]  $13 - 6 = 7$**

We cannot subtract 6 from 3, so move 1 hundred (=10 tens) from hundreds place to tens place and subtract 6 from 13.

$$\begin{array}{r} 642 \\ - 368 \\ \hline 274 \end{array}$$

**[Hundreds place]  $5 - 3 = 2$**

## 2.4 Subtraction with five-digit numbers



The spectators of yesterday's football match were 47543 people and today's spectators are 50238 people. What's the difference?

As we have to find difference, the operation should be         .



We subtract smaller number from bigger number.



Mathematical sentence is:  $50238 - 47543$

$$\begin{array}{r} 50238 \\ - 47543 \\ \hline 5 \end{array}$$

**[Ones place]**  $8 - 3 = 5$

$$\begin{array}{r} 1\ 10 \\ 50238 \\ - 47543 \\ \hline 95 \end{array}$$

**[Tens place]**  $13 - 4 = 9$

We cannot subtract 4 from 3, so move 1 hundred (=10 tens) from hundreds place to tens place and subtract.

$$\begin{array}{r} 10\ 1 \\ 50238 \\ - 47543 \\ \hline 695 \end{array}$$

**[Hundreds place]**  $11 - 5 = 6$

We cannot subtract 5 from 1, so we need to move 1 thousand (=10 hundred) from thousands place to hundreds place, but thousands place is 0. So we have to move 1 *ajut* (10 thousand) to thousands place. Then we move 1 thousand from thousands place

$$\begin{array}{r} 10\ 0 \\ 50238 \\ - 47543 \\ \hline 2695 \end{array}$$

**[Thousands place]**  $9 - 7 = 2$

We have moved 1 *ajut* (=10 thousand) to thousands place and moved 1 thousand to hundreds place, so we have 9 in this place.

$$\begin{array}{r} 1 \\ 50238 \\ - 47543 \\ \hline 2695 \end{array}$$

**[ajuts place]**  $4 - 4 = 0$

When the largest place is 0, we don't need to put 0.

The difference is: 2695 people

(Today's spectators are more than those of yesterday)



An author printed 10000 books, but as printing error was found in 54 books, he cannot sell them. How many books can he sell?

It's a problem for a remainder, so the operation is

Mathematical sentence is:  $10000 - 54$



$$\begin{array}{r} \phantom{0} \phantom{0} \phantom{0} \phantom{0} \phantom{0} \phantom{0} \\ 10000 \\ - \phantom{0000} 54 \\ \hline \end{array}$$

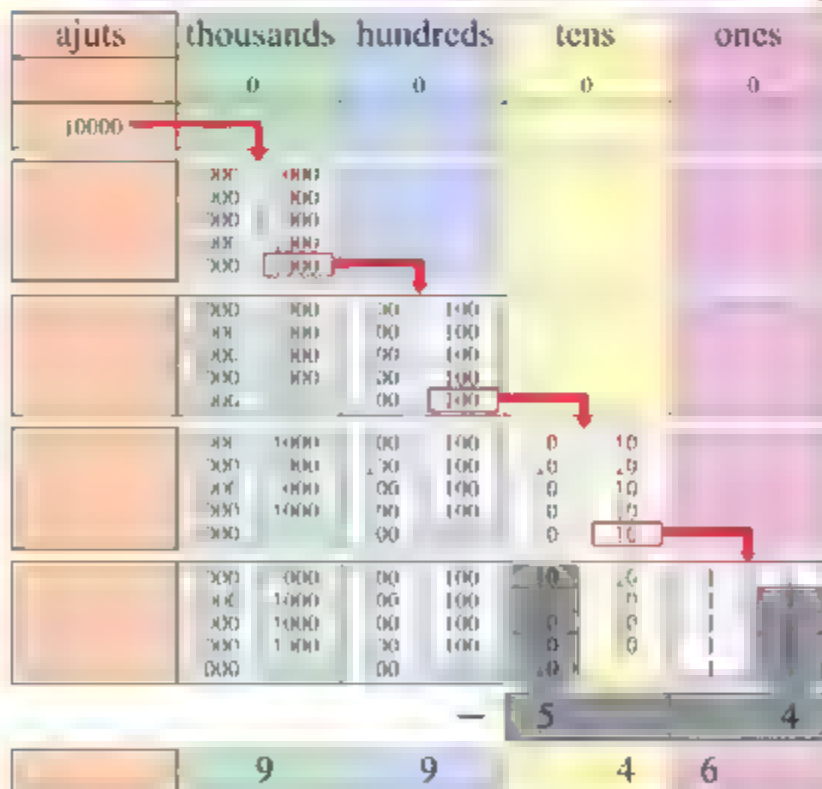
**[Ones place]**

We cannot subtract 4 from 0, so we need to move 1 ten (=10 ones) from tens place to ones place, but tens place is 0. So we have to move 10 tens from hundreds place, but that place is also 0. Besides thousands place is also 0.



Oh, no! How can we do, then?

Let's think about it with the picture chart.







Wow! We are replacing number from each stage.

$$\begin{array}{r} \text{9 9 9 10} \\ 10000 \\ - 54 \\ \hline \end{array}$$

Now we can subtract from ones place.



$$\begin{array}{r} \text{9 9 9 10} \\ 10000 \\ - 54 \\ \hline 9996 \end{array}$$

[Ones place]  $10 - 4 = 6$

$$\begin{array}{r} \text{9 9 9} \\ 9996 \\ - 54 \\ \hline 9946 \end{array}$$

[Tens place]  $9 - 5 = 4$

$$\begin{array}{r} \text{9 9} \\ 9946 \\ - 54 \\ \hline 9946 \end{array}$$

[Hundreds place]  
No subtraction.  
(or  $9 - 0 = 9$ )

$$\begin{array}{r} \text{9} \\ 9946 \\ - 54 \\ \hline 9946 \end{array}$$

[Thousands place]  
No subtraction.  
(or  $9 - 0 = 9$ )

He is able to sell 9946 books



Subtract :

(1)	(2)	(3)	(4)
$\begin{array}{r} 10000 \\ - 1 \\ \hline \end{array}$	$\begin{array}{r} 10000 \\ - 2468 \\ \hline \end{array}$	$\begin{array}{r} 10000 \\ - 9999 \\ \hline \end{array}$	$\begin{array}{r} 100000 \\ - 1 \\ \hline \end{array}$

## Addition and Subtraction



### Subtract :

(1)  $4900 - 3700$

(2)  $10000 - 8000$

(3)  $32000 - 12000$

(4)  $86000 - 85200$

(5) 
$$\begin{array}{r} 5396 \\ - 554 \\ \hline \end{array}$$

(6) 
$$\begin{array}{r} 2347 \\ - 1164 \\ \hline \end{array}$$

(7) 
$$\begin{array}{r} 7129 \\ - 3383 \\ \hline \end{array}$$

(8) 
$$\begin{array}{r} 8315 \\ - 7334 \\ \hline \end{array}$$

(9) 
$$\begin{array}{r} 76237 \\ - 1571 \\ \hline \end{array}$$

(10) 
$$\begin{array}{r} 16847 \\ - 1279 \\ \hline \end{array}$$

(11) 
$$\begin{array}{r} 76413 \\ - 2946 \\ \hline \end{array}$$

(12) 
$$\begin{array}{r} 10000 \\ - 5900 \\ \hline \end{array}$$

(13) 
$$\begin{array}{r} 10000 \\ - 7810 \\ \hline \end{array}$$

(14) 
$$\begin{array}{r} 10000 \\ - 3 \\ \hline \end{array}$$

(15) 
$$\begin{array}{r} 17003 \\ - 14096 \\ \hline \end{array}$$

(16) 
$$\begin{array}{r} 56004 \\ - 51428 \\ \hline \end{array}$$

(17) 
$$\begin{array}{r} 95014 \\ - 76317 \\ \hline \end{array}$$

(18) 
$$\begin{array}{r} 35220 \\ - 26241 \\ \hline \end{array}$$

(19) 
$$\begin{array}{r} 37152 \\ - 19356 \\ \hline \end{array}$$

(20) 
$$\begin{array}{r} 100000 \\ - 8 \\ \hline \end{array}$$



### Subtract sideways.



Just like addition, we can subtract the number of larger places from ones place, putting '\*' marks on the top of the calculated digit and check the carrying.

[Example]

$$\begin{array}{cccccccccccc} & 5 & & & 4 & & & & & & & & & \\ 6 & 3 & 4 & 5 & 3 & - & 2 & 7 & 2 & 4 & 6 & - & 3 & 6 & 2 & 0 & 7 \end{array}$$

(1)  $47560 - 35550$

(2)  $54300 - 31400$

(3)  $74444 - 36363$

(4)  $100000 - 11111$

## 2.5 Relation between Addition and Subtraction



A school has 5424 students in total. And the number of girls is 2631. How many boys are there?



We have to find out one part of the total students. So, the operation is .

Mathematical sentence is :  $5424 - 2631$

minuend	$\rightarrow$	4 13 10
subtrahend	$\rightarrow$	5 4 2 4
	$\rightarrow$	2 6 3 1
difference	$\rightarrow$	<u>2 7 9 3</u>

The answer is: 2793 boys

As we studied in grade 3, minuend, subtrahend and difference have certain relation



difference	$\swarrow$	minuend	$\searrow$	minuend
$+$		subtrahend	$-$	difference
subtrahend	$\swarrow$	difference	$\searrow$	subtrahend
minuend	$\searrow$	minuend	$\swarrow$	subtrahend

$$(\text{boys}) + (\text{girls}) = (\text{total}) \quad (\text{total}) - (\text{girls}) = (\text{boys}) \quad (\text{total}) - (\text{boys}) = (\text{girls})$$

By using this relationship between addition and subtraction, we can determine the third if we know any two out of the three

- 1 Like the previous one, read these two problems and answer.

A school has 2793 boys and 2631 girls. How many students are there in total?

A school has 5324 students in total and among them 2793 are boys. How many girls are there?

## 2.6 Problems related to addition and subtraction



There were 2450 passengers in the train. In one station, 842 passengers got off and 798 passengers got on. How many passengers are there in the train now?



'Getting off' should be subtraction and 'getting on' should be addition. How can we calculate it?

Mathematical sentence is:  $2450 - 842 + 798$

Let's calculate.

$$\begin{array}{r} 2450 \\ - 842 \\ \hline \end{array} \quad \begin{array}{r} \phantom{0000} \\ + 798 \\ \hline \end{array}$$

Now there are  passengers in the train.

1 ?

Rajib's mother had Tk. 5580. Before going to supermarket, she got Tk. 3420 from Rajib's father and spent Tk. 7830 on her shopping. How much is now left with her?



The sum of the present age of mother and her daughter is 112 years. 10 years ago, the daughter was 27 years old. What will be the age of the mother after 8 years from now?



- (1) 10 years ago, the daughter was 27 years old. How old is she now?
- (2) How old is the mother now?
- (3) Let's find the age of the mother after 8 years



Ah, We can solve the question one by one

It's interesting to find the other way to get the answer





## 2.6 Exercise

1. Do vertical calculation:

$$\begin{array}{r} \text{(1)} \quad 47258 \\ + 21631 \\ \hline \end{array}$$

$$\begin{array}{r} \text{(2)} \quad 23456 \\ + 56738 \\ \hline \end{array}$$

$$\begin{array}{r} \text{(3)} \quad 67342 \\ + 6579 \\ \hline \end{array}$$

$$\begin{array}{r} \text{(4)} \quad 58274 \\ + 31726 \\ \hline \end{array}$$

$$\begin{array}{r} \text{(5)} \quad 13242 \\ 34215 \\ + 22532 \\ \hline \end{array}$$

$$\begin{array}{r} \text{(6)} \quad 49847 \\ 12142 \\ + 18431 \\ \hline \end{array}$$

$$\begin{array}{r} \text{(7)} \quad 14537 \\ 32521 \\ 12512 \\ + 23524 \\ \hline \end{array}$$

$$\begin{array}{r} \text{(8)} \quad 17784 \\ 19986 \\ 19123 \\ 19667 \\ + 19446 \\ \hline \end{array}$$

$$\begin{array}{r} \text{(9)} \quad 4792 \\ - 982 \\ \hline \end{array}$$

$$\begin{array}{r} \text{(10)} \quad 34526 \\ - \quad \quad 8 \\ \hline \end{array}$$

$$\begin{array}{r} \text{(11)} \quad 66842 \\ - 5933 \\ \hline \end{array}$$

$$\begin{array}{r} \text{(12)} \quad 91276 \\ - 89669 \\ \hline \end{array}$$

$$\begin{array}{r} \text{(13)} \quad 87003 \\ - 6697 \\ \hline \end{array}$$

$$\begin{array}{r} \text{(14)} \quad 40068 \\ - 34174 \\ \hline \end{array}$$

$$\begin{array}{r} \text{(15)} \quad 81111 \\ - 58889 \\ \hline \end{array}$$

$$\begin{array}{r} \text{(16)} \quad 100000 \\ - \quad \quad 9 \\ \hline \end{array}$$

2. Do sideways calculation.

(1)  $13725 + 16131 + 12142 + 13103$

(2)  $20000 - 18760$

3. Fill in the blanks.

(1)  $\boxed{\phantom{00000}} - 6483 = 3517$

(2)  $6874 + \boxed{\phantom{00000}} = 9300$

(3)  $42700 + 28800 + \boxed{\phantom{00000}} = 100000$

#### Addition and Subtraction

4. In a godown there are 8375 sacks of sugar, 11860 sacks of wheat and 12720 sacks of rice. Find the total number of sacks in the godown.
5. Find the number which is 500 larger than 1543.
6. What is the difference between the largest and the smallest numbers formed by the digits 6, 4, 8 and 0 using each digit only once?
7. What number can we add to 56806 so that their sum will be 64932?
8. The sum of three numbers is 84025. Among them two numbers are 12450 and 37865. What is the third number?
9. Shihab has taka 390 more than that of Gita. And Gita has taka 470 less than that of Shimul. Shimul has taka 890. How much money do Shihab and Gita have?

10. This table shows the number of students of a school. The total number of girls is 3837. How many boys are there in the school?

Class	Number of students (boys and girls)
1	1632
2	1581
3	1543
4	1499
5	1577

11. Sohag bought a motorcycle by taka 70000. It costs 1500 taka for registration and taka 800 for repairing. If he sells the motorcycle for taka 90000, how much profit will he get?
12. There are a Banyan tree and a Pine tree in a park. 150 years ago, the sum of the age of the trees was 2961 years. Now the Pine tree is 1432 years old. What will be the age of the Banyan tree after 200 years?

## Chapter Three

# Multiplication

### 3.1 Multiplication of two-three digit numbers



Multiply:

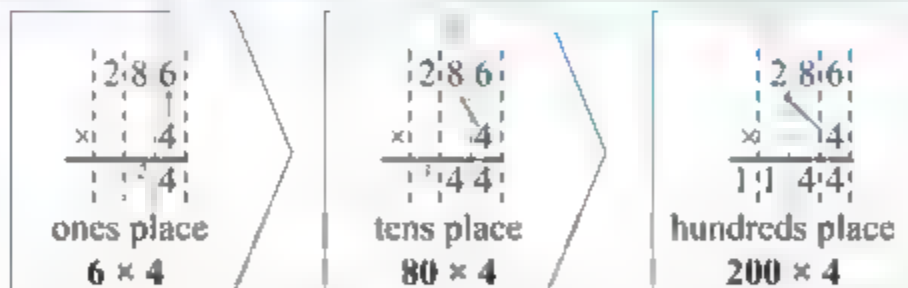
- |   |   |   |   |   |
|---|---|---|---|---|
| (1)<br>$\begin{array}{r} 23 \\ \times 3 \\ \hline \end{array}$  | (2)<br>$\begin{array}{r} 17 \\ \times 4 \\ \hline \end{array}$  | (3)<br>$\begin{array}{r} 221 \\ \times 3 \\ \hline \end{array}$ | (4)<br>$\begin{array}{r} 310 \\ \times 4 \\ \hline \end{array}$ | (5)<br>$\begin{array}{r} 286 \\ \times 6 \\ \hline \end{array}$   |
| (6)<br>$\begin{array}{r} 663 \\ \times 8 \\ \hline \end{array}$ | (7)<br>$\begin{array}{r} 567 \\ \times 3 \\ \hline \end{array}$ | (8)<br>$\begin{array}{r} 306 \\ \times 4 \\ \hline \end{array}$ | (9)<br>$\begin{array}{r} 21 \\ \times 48 \\ \hline \end{array}$ | (10)<br>$\begin{array}{r} 248 \\ \times 32 \\ \hline \end{array}$ |



Let's review how to calculate  $286 \times 4$

$286$	
$\times 4$	
$24$	$6 \times 4$
$320$	$\leftarrow 80 \times 4$
$800$	$\leftarrow 200 \times 4$
$1144$	

Procedure of the calculation



**$6 \times 4 = 24$**

Put 4 in ones place, and carry 2 in tens place

**$8 \times 4 = 32$**

Add 2 as the carrying number. ( $32 + 2 = 34$ )  
This **34** is placed for **34 tens**.

**$2 \times 4 = 8$**

Add 3 as the carrying number. ( $8 + 3 = 11$ )  
This **11** is placed for **11 hundreds**.

## Multiplication

Let's review how to calculate  $248 \times 32$

Procedure of the calculation

Basic idea	$248$	$248$	$248$	$248$
	$\times 32$	$\times 32$	$\times 32$	$\times 32$
$248 \times 2 \rightarrow$	$496$	$496$	$496$	$496$
$248 \times 30 \rightarrow$	$7440$	$7440$	$7440$	$7440$
	$7936$	$7936$	$7936$	$7936$

$248 \times 2 = 496$

$248 \times 30$   
 We regard  
 $248 \times 30$  as  
 $248 \times 3 \times 10$ .

$496 + 7440$   
 Put '0' to show  
 the calculation  
 for tens place

## Numbers multiplied by 10 and 100

thousands	hundreds	tens	ones	
2	3	0	0	10 times
	2	3	0	100 times
		2	3	10 times

To multiply any number by 10, move all the numbers one place to the left and put a 0 to the right.

To multiply any number by 100, move all the numbers two places to the left and put two 0s to the right.

### 1. Multiply

- |                    |                     |                      |                      |
|--------------------|---------------------|----------------------|----------------------|
| (1) $5 \times 10$  | (2) $13 \times 10$  | (3) $631 \times 10$  | (4) $100 \times 10$  |
| (5) $8 \times 100$ | (6) $74 \times 100$ | (7) $987 \times 100$ | (8) $100 \times 100$ |

## 3.2 Multiplication of three-four digit numbers



Let's try to multiply with larger numbers.



There are some Hilsha fishes each of which costs Tk 305. If you buy 53 of them, how much will it cost in total?



As we know the price of one piece, then we can find out the price of several pieces by

Mathematical sentence is:  $305 \times 53$

Procedure of the calculation

$$\begin{array}{r} 305 \times 3 \\ 305 \times 50 \end{array}$$

$$\begin{array}{r} 305 \\ \times 53 \\ \hline 915 \end{array}$$

$$\begin{array}{r} 305 \\ \times 53 \\ \hline 915 \\ 15250 \end{array}$$

$$\begin{array}{r} 305 \\ \times 53 \\ \hline 915 \\ 15250 \\ \hline 16165 \end{array}$$

Total cost is taka 16165

We regard.

$$305 \times 50 \text{ as } 305 \times 5 \times 10$$

1 Multiply.

(1)  $\begin{array}{r} 126 \\ \times 67 \\ \hline \end{array}$

(2)  $\begin{array}{r} 325 \\ \times 28 \\ \hline \end{array}$

(3)  $\begin{array}{r} 567 \\ \times 78 \\ \hline \end{array}$

(4)  $\begin{array}{r} 280 \\ \times 63 \\ \hline \end{array}$

(5)  $\begin{array}{r} 841 \\ \times 60 \\ \hline \end{array}$

(6)  $\begin{array}{r} 891 \\ \times 90 \\ \hline \end{array}$

(7)  $\begin{array}{r} 400 \\ \times 77 \\ \hline \end{array}$

(8)  $\begin{array}{r} 600 \\ \times 89 \\ \hline \end{array}$

(9)  $\begin{array}{r} 500 \\ \times 73 \\ \hline \end{array}$

(10)  $\begin{array}{r} 205 \\ \times 54 \\ \hline \end{array}$

(11)  $\begin{array}{r} 803 \\ \times 35 \\ \hline \end{array}$

(12)  $\begin{array}{r} 705 \\ \times 34 \\ \hline \end{array}$



## Multiplication



Let's explain how to calculate "three digit  $\times$  three digit".

$$423 \times 234$$

Procedure of the calculation

	$\times$	
	$\times$	
	$\times$	

$$\begin{array}{r} 423 \\ \times 234 \\ \hline 1692 \end{array}$$

$$\begin{array}{r} 423 \\ \times 234 \\ \hline 1692 \\ 12690 \end{array}$$

$$\begin{array}{r} 423 \\ \times 234 \\ \hline 1692 \\ 12690 \\ 84600 \end{array}$$

$$\begin{array}{r} 423 \\ \times 234 \\ \hline 1692 \\ 12690 \\ 84600 \\ \hline 98982 \end{array}$$

We regard:  $423 \times 30$  as

	$\times$		$\times$	
--	----------	--	----------	--

We regard:  $423 \times 200$  as

	$\times$		$\times$	
--	----------	--	----------	--



Multiply:

(1)  $\begin{array}{r} 152 \\ \times 171 \\ \hline \end{array}$

(2)  $\begin{array}{r} 448 \\ \times 141 \\ \hline \end{array}$

(3)  $\begin{array}{r} 398 \\ \times 122 \\ \hline \end{array}$

(4)  $\begin{array}{r} 242 \\ \times 208 \\ \hline \end{array}$

(5)  $\begin{array}{r} 149 \\ \times 617 \\ \hline \end{array}$

(6)  $\begin{array}{r} 123 \\ \times 747 \\ \hline \end{array}$

(7)  $\begin{array}{r} 556 \\ \times 169 \\ \hline \end{array}$

(8)  $\begin{array}{r} 122 \\ \times 125 \\ \hline \end{array}$

(9)  $\begin{array}{r} 501 \\ \times 140 \\ \hline \end{array}$

(10)  $\begin{array}{r} 140 \\ \times 148 \\ \hline \end{array}$

(11)  $\begin{array}{r} 242 \\ \times 244 \\ \hline \end{array}$

(12)  $\begin{array}{r} 698 \\ \times 132 \\ \hline \end{array}$

Challenge

(13)  $\begin{array}{r} 1234 \\ \times 56 \\ \hline \end{array}$

(14)  $\begin{array}{r} 3247 \\ \times 29 \\ \hline \end{array}$

(15)  $\begin{array}{r} 2015 \\ \times 322 \\ \hline \end{array}$

(16)  $\begin{array}{r} 6250 \\ \times 16 \\ \hline \end{array}$



Which way do you think is easier to calculate, (a) or (b)?  
And explain why?

(a)	(b)	(a)	(b)
$\begin{array}{r} 326 \\ \times 203 \\ \hline 978 \\ 0000 \\ 65200 \\ \hline 66178 \end{array}$	$\begin{array}{r} 326 \\ \times 203 \\ \hline 978 \\ 65200 \\ \hline 66178 \end{array}$	$\begin{array}{r} 138 \\ \times 70 \\ \hline 000 \\ 9660 \\ \hline 9660 \end{array}$	$\begin{array}{r} 138 \\ \times 70 \\ \hline 9660 \end{array}$



Hmm (b) looks shorter. What's the difference?

Multiplication of '0' is omitted. It's a good idea. But we must be careful about the places of the digits.



### 3 Multiply

(1) 
$$\begin{array}{r} 162 \\ \times 202 \\ \hline \end{array}$$

(2) 
$$\begin{array}{r} 248 \\ \times 305 \\ \hline \end{array}$$

(3) 
$$\begin{array}{r} 472 \\ \times 109 \\ \hline \end{array}$$

(4) 
$$\begin{array}{r} 205 \\ \times 407 \\ \hline \end{array}$$

(5) 
$$\begin{array}{r} 38 \\ \times 70 \\ \hline \end{array}$$

(6) 
$$\begin{array}{r} 203 \\ \times 90 \\ \hline \end{array}$$

(7) 
$$\begin{array}{r} 123 \\ \times 300 \\ \hline \end{array}$$

(8) 
$$\begin{array}{r} 462 \\ \times 200 \\ \hline \end{array}$$

## Multiplication



Let us do the vertical calculation for  $19 \times 267$ . Let us compare the following two methods and think which one is simpler

<p>(a)</p> $\begin{array}{r} 19 \\ \times 267 \\ \hline 133 \\ 114 \\ 38 \\ \hline 5073 \end{array}$	<p>(b)</p> $\begin{array}{r} 267 \\ \times 19 \\ \hline 2403 \\ 267 \\ \hline 5073 \end{array}$
--	---

← multiplicand

← multiplier

← product



I remember that we can switch the order of the **multiplicand** and **multiplier** and still get the same product.

So, we can change  $19 \times 267$  into  $267 \times 19$

$$\begin{array}{c} 4 \\ 3 \times 4 = 12 \end{array}$$

$$\begin{array}{c} 3 \\ 4 \times 3 = 12 \end{array}$$

As the calculations above show, in vertical calculation, considering smaller digit number as multiplier enables us to calculate easier.



7 Tell the difference by comparing the following calculations.

(a)  $\begin{array}{r} 27 \\ \times 369 \\ \hline \end{array}$

(b)  $\begin{array}{r} 369 \\ \times 27 \\ \hline \end{array}$

(c)  $\begin{array}{r} 48 \\ \times 1273 \\ \hline \end{array}$

(d)  $\begin{array}{r} 1273 \\ \times 48 \\ \hline \end{array}$

5 Do vertical calculation by the simple method.

(1)  $21 \times 459$

(2)  $48 \times 273$

(3)  $54 \times 264$

(4)  $30 \times 167$

(5)  $40 \times 178$

(6)  $2 \times 5478$

### 3.3 The simple method



Let's find the easiest way to get to answers.



Let us use ' $25 \times 7 = 175$ ' to calculate  $2500 \times 700$



$$\begin{array}{rcl}
 25 & \times & 7 = 175 \\
 \downarrow (10) & & \downarrow (10) \\
 2500 & \times & 7 = 17500 \\
 & & \downarrow (10) \\
 2500 & \times & 700 = 1750000
 \end{array}$$

= 10000



$$\begin{array}{l}
 2500 \times 700 \\
 = 25 \times 100 \times 7 \times 100 \\
 = 25 \times 7 \times 100 \times 100 \\
 = 175 \times 10000 \\
 = 1750000
 \end{array}$$



Both the results are same! Moreover, they have calculated by the simple method.

1 ?

Use ' $27 \times 32 = 864$ ' to do the following calculations.

(1)  $270 \times 320$

(2)  $2700 \times 32$

(3)  $270 \times 3200$

Can't we apply this method to vertical calculation? What do you think?



## Multiplication



Then let's try to do vertical calculation of  $3400 \times 260$  by using the simple method,  $34 \times 26 = 884$ .

$$\begin{array}{r}
 34 \mid 00 \\
 \times 26 \mid 0 \\
 \hline
 204 \mid 0 \\
 680 \mid \\
 \hline
 884 \mid 000
 \end{array}$$

$\xleftarrow{100 \text{ times}} 34$   
 $\xleftarrow{\times 26}$   
 $\xleftarrow{100 \text{ times}} 204$   
 $\xleftarrow{100 \text{ times}} 68$   
 $\xleftarrow{100 \text{ times}} 884$

We can consider:

$$\begin{aligned}
 & 3400 \times 260 \\
 &= 34 \times 100 \times 26 \times 10 \\
 &= 34 \times 26 \times 100 \times 10 \\
 &= 884 \times 1000
 \end{aligned}$$

On the other hand, we firstly multiply the numbers without using 0. And we secondly put 0 at the end of the product as the same number that the multiplicand and the multiplier have.



Let's compare it with the former method.

$$\begin{array}{r}
 3400 \\
 \times 260 \\
 \hline
 204000 \\
 680000 \\
 \hline
 884000
 \end{array}$$

Wow! It has too many 0s and is complicated!

2 ?

Do vertical calculation with the simple method

(1)  $36 \times 20$

(2)  $180 \times 14$

(3)  $23 \times 1700$

(4)  $130 \times 60$

(5)  $2630 \times 30$

(6)  $153 \times 200$

(7)  $1230 \times 400$

(8)  $16700 \times 20$



### 3.4 Exercise

1. Multiply:

(1)  $752 \times 10$

(2)  $100 \times 10$

(3)  $453 \times 100$

(4)  $100 \times 100$

(5) 
$$\begin{array}{r} 145 \\ \times 26 \\ \hline \end{array}$$

(6) 
$$\begin{array}{r} 719 \\ \times 88 \\ \hline \end{array}$$

(7) 
$$\begin{array}{r} 560 \\ \times 63 \\ \hline \end{array}$$

(8) 
$$\begin{array}{r} 928 \\ \times 70 \\ \hline \end{array}$$

(9) 
$$\begin{array}{r} 406 \\ \times 78 \\ \hline \end{array}$$

(10) 
$$\begin{array}{r} 208 \\ \times 30 \\ \hline \end{array}$$

(11) 
$$\begin{array}{r} 137 \\ \times 232 \\ \hline \end{array}$$

(12) 
$$\begin{array}{r} 132 \\ \times 746 \\ \hline \end{array}$$

(13) 
$$\begin{array}{r} 314 \\ \times 209 \\ \hline \end{array}$$

(14) 
$$\begin{array}{r} 449 \\ \times 219 \\ \hline \end{array}$$

(15) 
$$\begin{array}{r} 207 \\ \times 429 \\ \hline \end{array}$$

(16) 
$$\begin{array}{r} 307 \\ \times 203 \\ \hline \end{array}$$

(17) 
$$\begin{array}{r} 1265 \\ \times 34 \\ \hline \end{array}$$

(18) 
$$\begin{array}{r} 3597 \\ \times 24 \\ \hline \end{array}$$

(19) 
$$\begin{array}{r} 2044 \\ \times 41 \\ \hline \end{array}$$

(20) 
$$\begin{array}{r} 4189 \\ \times 21 \\ \hline \end{array}$$

2. Do vertical calculation by the simple method.

(1)  $61 \times 256$

(2)  $34 \times 567$

(3)  $40 \times 456$

(4)  $1650 \times 30$

(5)  $789 \times 200$

(6)  $1230 \times 200$

3. Use ' $48 \times 19 = 912$ ' to do the following calculations.

(1)  $480 \times 190$

(2)  $4800 \times 19$

(3)  $480 \times 1900$

4 Explain where the calculations are wrong. Later calculate them correctly.

(A) 
$$\begin{array}{r} 143 \\ \times 62 \\ \hline 286 \\ 858 \\ \hline 1144 \end{array}$$

(B) 
$$\begin{array}{r} 901 \\ \times 83 \\ \hline 273 \\ 728 \\ \hline 7553 \end{array}$$

## Multiplication

5. Fill the boxes with appropriate digits:

Challenge

(1)

$$\begin{array}{r} 23 \\ \times 3\Box \\ \hline 6\Box \\ 690 \\ \hline 7\Box9 \end{array}$$

(2)

$$\begin{array}{r} \Box\Box3 \\ \times \Box\Box \\ \hline 2372 \end{array}$$

(3)

$$\begin{array}{r} \Box9 \\ \times \Box\Box \\ \hline \Box7\Box \\ \Box1\Box0 \\ \hline \Box\Box43 \end{array}$$

6. You have 100 notes of "one hundred taka". How much money do you have?
7. There are 37 boxes which contain 500 tickets of a cricket match. How many tickets are there in the boxes?
8. Rahima earns taka 125 daily by sewing. How much money does she earn in 25 days?
9. You have fifteen pieces of 230 metres of ropes. If you put them in one line, what will be the total length of the ropes?
10. If you put Tk. 165 per month in an earthen pot, how much money can you save in one year?
11. Selim sold 185 hens from his poultry farm. He got taka 275 for each hen. How much money did he get in total?
12. 78 pieces of paper are needed to make an exercise book. If you make 955 exercise books, how many pieces of paper will you need?



## Chapter Four

# Division

### 4.1 Division by divisor of one-digit number



Divide:

(1)  $42 \div 7$  (2)  $57 \div 8$  (3)  $240 \div 3$  (4)  $420 \div 5$

(5)  $4)80($  (6)  $9)73($  (7)  $6)84($  (8)  $5)61($

Let's review how to divide  $93 \div 4$ .



dividend

$$4)93($$

divisor

$$\begin{array}{r} 4 \overline{)93} \\ \underline{8} \phantom{0} \\ 1 \phantom{0} \end{array}$$

Just look at tens place of dividend. Write 2 as a quotient of tens place on the right. Multiply 4 by 2 and get 8. Subtract 8 from 9 and get 1. For tens place  $9 \div 4 = 2$  remainder 1

Bring 3 down.

$$\begin{array}{r} 4 \overline{)93} \\ \underline{8} \phantom{0} \\ 13 \end{array}$$

quotient

$$4)93(23$$

$$\begin{array}{r} 4 \overline{)93} \\ \underline{8} \phantom{0} \\ 13 \\ \underline{12} \\ 1 \end{array}$$

remainder

Write 3 as a quotient of ones place on the right. Multiply 4 by 3 and get 12. Subtract 12 from 13 and get 1 as the remainder. For ones place  $13 \div 4 = 3$  remainder 1

**Quotient 23 Remainder 1**

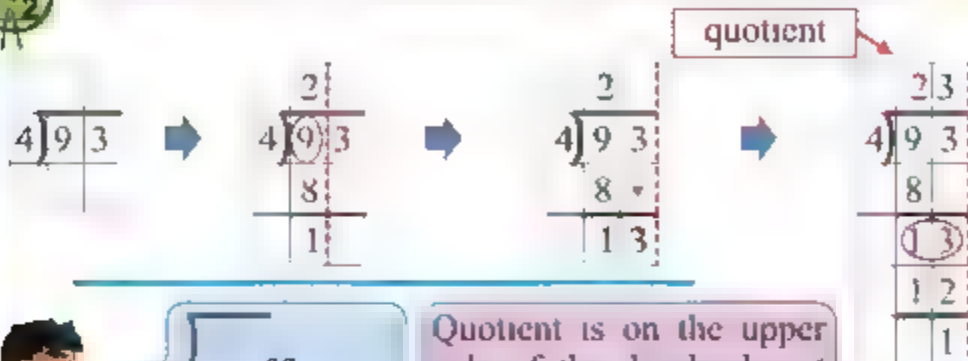
We write this as **Quotient 23 remainder 1.**

We generally calculate division by this method. However there are other methods for doing division.

Division



Compare the following method for division with the previous one



so interesting.

Quotient is on the upper side of the dividend, not on right side of it. But the basic process looks like the same.

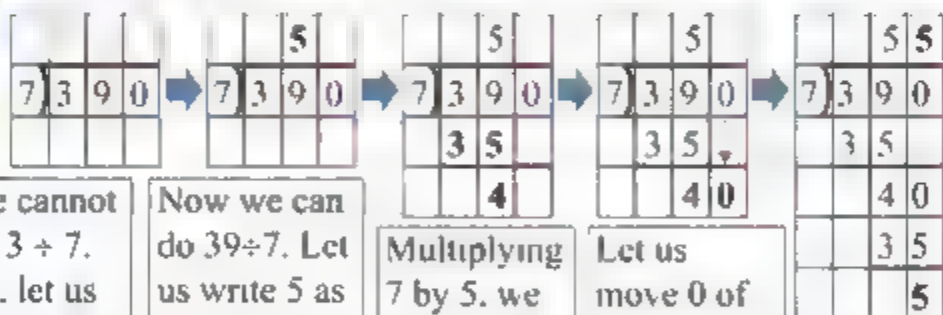


The basic process is the same but only the position of the quotient is different. As the place of quotient is in accordance with that of dividend, we don't have to worry about the place of quotient.

After Grade 4, this method will be adopted as the method of division.



Do the division of  $390 \div 7$ .



We cannot do  $3 \div 7$ . So, let us notice the tens place

Now we can do  $39 \div 7$ . Let us write 5 as a quotient on the tens place

Multiplying 7 by 5, we get 35. We subtract 35 from 39 and get 4.

Let us move 0 of ones place down.

Now we do  $40 \div 7$  in the same way.

**Quotient 55 remainder 5**



Do the division in the international method.

(1)  $4 \overline{)80}$

(2)  $9 \overline{)73}$

(3)  $6 \overline{)84}$

(4)  $5 \overline{)63}$

(5)  $6 \overline{)264}$

(6)  $8 \overline{)182}$

(7)  $7 \overline{)819}$

(8)  $3 \overline{)638}$



Let us write a mathematical sentence and think which of the following problems can be solved by the method of division.

(1) If 18 candies are divided equally among 3 people, how many candies will each person get? ? ? ?



Answer  
6 candies

(2) If 18 candies are distributed so that each person gets 3 candies, how many people will get candies?



Answer  
6 people

The mathematical sentences of both (1) and (2) are  $18 \div 3 = 6$ . In both cases, 'Equal Division' and 'Equal Distribution' methods are used.

### How to check answers

#### – Relation between multiplication and division–

If 20 candies are distributed so that each person gets 3 pieces, how many people can get candies and how many candies will be left?



Mathematical sentence:  $20 \div 3 = 6$ , remainder 2

Answer: 6 people will get candies and two candies will be left.

Let us confirm that adding the 2 remaining candies to the product of  $(3 \times 6)$  makes 20 candies.

$$\begin{array}{ccccccc} \textcircled{20} & \div & 3 & = & 6 & \text{remainder } 2 & \\ & & \downarrow & & \downarrow & & \downarrow \\ & & 3 \times 6 & + & 2 & = & \textcircled{20} \end{array}$$

match

**divisor  $\times$  quotient + remainder = dividend**

This calculation can be used when you check the answers of division



## 4.2 Division of 'three-digit number by two-digit number'



Let's try division with larger numbers.



You have 80 candies and each 10 candies are in the small bags.  
(1) If you distribute all the candies among your friends by 20 candies each, how many friends can get candies?

Mathematical sentence:  $80 \div 20$

Now let's think about it in terms of small bags.



Considering group of 10:  $8 \div 2$



Oh, we can regard  $80 \div 20$  as  $8 \div 2$  in terms of 10

$$80 \div 20 = 4 \quad \text{Answer: 4 persons}$$

(2) If you distribute 30 candies among each of your friends, how many of your friends will get candies?

Mathematical sentence:  $80 \div 30$



Remainder

Considering group of 10:  $8 \div 3$

$$80 \div 30 = 2 \text{ remainder } 20$$

Answer 2 friends get candies and 20 candies are left



Check the answers in the previous page using the following formula

$$\text{Divisor} \times \text{quotient} + \text{remainder} = \text{dividend}$$

(1)  $80 \div 20 = 4$  Correct. match  $20 \times 4 = 80$

(2)  $80 \div 30 = 2 \text{ remainder } 20$  Correct. match  $30 \times 2 + 20 = 80$

1 Do division and check the answers.

- (1)  $90 \div 30$  (2)  $80 \div 40$  (3)  $120 \div 40$  (4)  $240 \div 60$   
 (5)  $420 \div 70$  (6)  $400 \div 50$  (7)  $50 \div 20$  (8)  $80 \div 30$   
 (9)  $120 \div 30$  (10)  $210 \div 50$  (11)  $390 \div 60$  (12)  $500 \div 90$

2 Find the mistake in the calculation below. And find the correct answer.

$$190 \div 40 = 4, \text{ remainder } 3$$



You have 85 candies. If you give 21 candies to each of your friends, how many friends will get candies?

The problem is similar to the previous one.

Mathematical sentence is:



Firstly, let's estimate the quotient.



Think about 85 as 80 and 21 as 20

$$85 \div 21 \rightarrow 80 \div 20 \rightarrow 8 \div 2$$

Estimation of the quotient is :  $8 \div 2 = 4$

Now, let's think about how to do the long division for  $85 \div 21$



## Division

$$\begin{array}{r}
 21 \overline{)85} \rightarrow 21 \overline{)85}^4 \rightarrow 21 \overline{)85}^4_{84} \rightarrow 21 \overline{)85}^4_{84}_1
 \end{array}$$

1. Look at **tens place** of dividend. But we cannot do  $8 \div 21$ . So move to **ones place**.

2. Now we can do  $85 \div 21$ . We write estimated 4 as a quotient on ones place.

3. Multiply 21 by 4 and get 84.

4. Subtract 84 from 85 and get 1 as a remainder.

$$85 \div 21 = 4, \text{ remainder } 1$$

Each will get 4 candies and 1 candy will be left.



Let's do the vertical calculation for  $62 \div 31$ .



We can think about 62 as 60 and 31 as 30

$$62 \div 31 \rightarrow 60 \div 30 \rightarrow 6 \div 3$$

Estimation of the quotient is :  $6 \div 3 = 2$

$$\begin{array}{r}
 31 \overline{)62} \rightarrow 31 \overline{)62}^2 \rightarrow 31 \overline{)62}^2_{62} \rightarrow 31 \overline{)62}^2_{62}_0 \\
 \hline
 62 \div 31 = 2
 \end{array}$$

3 Do vertical calculation.

$$21 \overline{)63}$$

$$11 \overline{)66}$$

$$24 \overline{)51}$$

$$35 \overline{)72}$$

4 Do vertical calculation.

(1)  $36 \div 12$

(2)  $96 \div 32$

(3)  $76 \div 38$

(4)  $94 \div 47$

(5)  $25 \div 12$

(6)  $78 \div 11$

(7)  $84 \div 41$

(8)  $94 \div 45$

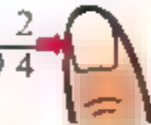
**Use of your finger:**

It's convenient to use your finger when you check the place

$$45 \overline{)9}$$

'We cannot do  $9 \div 45$ '

$$45 \overline{)94}$$

'Now we can do  $94 \div 45$ '

There are 165 pencils in a box. If we distribute an equal number of pencils among 55 people, how many pencils will each person get?

For dividing into equal numbers, we choose Mathematical sentence is: Estimation:  $165 \div 55 \rightarrow 160 \div 50 \rightarrow 16 \div 5 \rightarrow$  About 3

$$\begin{array}{r}
 55 \overline{)165} \rightarrow 55 \overline{)165} \rightarrow \begin{array}{r} 3 \\ 55 \overline{)165} \\ \underline{165} \end{array} \rightarrow \begin{array}{r} 3 \\ 55 \overline{)165} \\ \underline{165} \\ 0 \end{array}
 \end{array}$$

1. In **hundreds** place, we cannot do  $1 \div 55$ . So move to **tens** place.

2. In **tens** place, we also cannot do  $16 \div 55$ . So move to **ones** place.

3. Now we can do  $165 \div 55$ . We write estimated 3 as a quotient on ones place. Multiply 55 by 3 and get 165.

4. Subtract 165 from 165 and get 0. No remainder.

$$165 \div 55 = 3$$

Answer: Each person will get 3 pencils.

**5 Do vertical calculation.**

- (1)  $129 \div 43$     (2)  $128 \div 32$     (3)  $415 \div 83$     (4)  $359 \div 51$   
 (5)  $382 \div 62$     (6)  $314 \div 43$     (7)  $662 \div 94$     (8)  $239 \div 47$

## Division

Estimation is not always correct. It may be higher or lower. Then we have to revise it.



Divide :

(1)  $95 \div 34$

$90 \div 30$

$9 \div 3$

$3$

Choose smaller number

$$\begin{array}{r} 3 \xrightarrow{\text{Choose smaller number}} 2 \\ 34 \overline{) 95} \quad \rightarrow \quad 34 \overline{) 95} \\ \underline{102} \quad \leftarrow \\ 27 \end{array}$$

Too big, so subtract

If your estimated quotient is too large, put the next smaller number.



(2)  $189 \div 27$

$189 \div 27$

$180 \div 20$

$9$

$$\begin{array}{r} 9 \xrightarrow{\quad} 8 \xrightarrow{\quad} 7 \\ 27 \overline{) 189} \quad \rightarrow \quad 27 \overline{) 189} \quad \rightarrow \quad 27 \overline{) 189} \\ \underline{243} \quad \leftarrow \quad \underline{216} \quad \leftarrow \quad \underline{189} \\ 0 \end{array}$$

Too big, so subtract      Still too big

(3)  $77 \div 18$

$77 \div 18$

$70 \div 20$

About 3

23 includes one more 18

$$\begin{array}{r} 3 \xrightarrow{\quad} 4 \\ 18 \overline{) 77} \quad \rightarrow \quad 18 \overline{) 77} \\ \underline{54} \quad \leftarrow \quad \underline{72} \\ 23 \quad \quad \quad 5 \end{array}$$

If the remainder is too large, put the next larger number.



6

Divide :

(1)  $86 \div 24$

(2)  $97 \div 19$

(3)  $91 \div 13$

(4)  $75 \div 15$





There are 432 pieces of paper. If you distribute an equal number of pieces among 18 people, how many pieces will each one get?



When we divide equally we use

Mathematical sentence is

Estimation:  $\rightarrow 430 \div 20 \rightarrow 43 \div 2 \rightarrow$  About 20

$$\begin{array}{r}
 18 \overline{)432} \\
 \underline{36} \phantom{0} \\
 72 \\
 \underline{72} \\
 0
 \end{array}
 \rightarrow
 \begin{array}{r}
 2 \\
 18 \overline{)432} \\
 \underline{36} \phantom{0} \\
 72 \\
 \underline{72} \\
 0
 \end{array}
 \rightarrow
 \begin{array}{r}
 24 \\
 18 \overline{)432} \\
 \underline{36} \phantom{0} \\
 72 \\
 \underline{72} \\
 0
 \end{array}$$

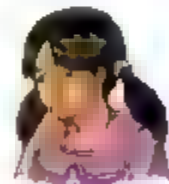
1. In hundreds place we cannot do  $4 \div 18$ , but in tens place, we can do  $43 \div 18$ .

2. Write 2 as quotient of tens place on top and multiply 18 by 2 to get 36. Subtract 36 from 43 and get 7.

3. Move to ones place and bring 2 down. Now we have 72.

4. Now we do  $72 \div 18$  and find 4 as quotient of ones place and no remainder.

We should compare the quotient with the estimation to check whether it's correct or not. In this case 24 is near to 20. It's OK.



$$432 \div 18 = 24$$

Each person will get 24 sheets

7 Do vertical division.

(1)  $682 \div 22$

(2)  $945 \div 45$

(3)  $672 \div 32$

(4)  $739 \div 32$

(5)  $572 \div 12$

(6)  $610 \div 19$

(7)  $690 \div 16$

(8)  $970 \div 46$

Division



Do the following vertical division.

$$941 \div 23$$

$$\begin{array}{r} 40 \\ 23 \overline{)941} \\ \underline{92} \phantom{0} \\ 21 \end{array}$$

$$\begin{array}{r} 40 \\ 23 \overline{)941} \\ \underline{92} \phantom{0} \\ 21 \phantom{0} \\ \underline{0} \phantom{0} \\ 21 \end{array}$$

$21 \div 23$  is not possible but there should be a digit in ones place.  
So put '0' as quotient of ones place.



Do vertical division.

(1)  $711 \div 23$

(2)  $731 \div 18$

(3)  $763 \div 25$

(4)  $810 \div 27$

### 4.3 Division of four-digit number by two-digit number.



Do vertical calculation.

(1)  $3266 \div 23 \Rightarrow 3000 \div 20 \Rightarrow 300 \div 2 \Rightarrow \text{About } 150$

$$\begin{array}{r} 100 \\ 23 \overline{)3266} \\ \underline{23} \phantom{00} \\ 96 \phantom{0} \\ \underline{92} \phantom{0} \\ 46 \end{array}$$

$$\begin{array}{r} 140 \\ 23 \overline{)3266} \\ \underline{23} \phantom{00} \\ 96 \phantom{0} \\ \underline{92} \phantom{0} \\ 46 \end{array}$$

$$\begin{array}{r} 142 \\ 23 \overline{)3266} \\ \underline{23} \phantom{00} \\ 96 \phantom{0} \\ \underline{92} \phantom{0} \\ 46 \phantom{0} \\ \underline{46} \phantom{0} \\ 0 \end{array}$$

$$\underline{3266 \div 23 = 142}$$

$$(2) 1576 \div 17 \rightarrow 1600 \div 2 \rightarrow 160 \div 2 \rightarrow \text{about } 80$$

$$17 \overline{)1576} \rightarrow 17 \overline{)1576} \rightarrow 17 \overline{)1576}$$

$$\begin{array}{r} 92 \\ 17 \overline{)1576} \\ \underline{153} \phantom{0} \\ 46 \\ \underline{34} \\ 12 \end{array}$$

$$1576 \div 17 = 92, \text{ remainder } 12$$



Both (1) and (2) divisions are "4-digit + 2-digit" numbers. And one quotient is 3-digit number and another is 2-digit. That's mysterious.

Can you tell why the difference occurs?



1 Do vertical division.

$$(1) 3038 \div 14 \quad (2) 7824 \div 48 \quad (3) 5876 \div 32 \quad (4) 4213 \div 27$$

$$(5) 4032 \div 63 \quad (6) 4920 \div 54 \quad (7) 6100 \div 72 \quad (8) 1512 \div 126$$

Challenge!

#### 4.4 The simple method



Let's find the simple way to get to answers.



Compare the division of  $6 \div 2$ ,  $60 \div 20$  and  $600 \div 200$

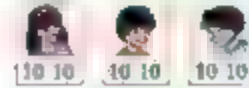
$$6 \div 2$$

6 candies are distributed so that each person gets 2 pieces...



$$60 \div 20$$

60 candies are distributed so that each person gets 20 pieces...



$$600 \div 200$$

600 candies are distributed so that each person gets 200 pieces...



## Division



Wow! In all the cases, three persons get candies. The quotient is same.

$$\begin{array}{lcl}
 6 \div 2 = 3 & & 6 \div 2 = 3 \\
 \downarrow \times 10 & & \uparrow \div 10 \\
 60 \div 20 = 3 & & 60 \div 20 = 3 \\
 \downarrow \times 100 & & \uparrow \div 100 \\
 600 \div 200 = 3 & & 600 \div 200 = 3 \\
 \text{Equal} & & \text{Equal}
 \end{array}$$

If you multiply or divide the divisor and dividend in a division by the same number, the quotient stays the same.

We can apply the properties of division to our calculation.



Using the properties of division, let's try the following calculation.

- (1)  $800 \div 200$       (2)  $1400 \div 200$       (3)  $3500 \div 700$   
 (4)  $5400 \div 60$       (5)  $1000 \div 100$       (6)  $10000 \div 1000$



It is one idea to score out the same number of 0s.

[Example]  $800 \div 200 = 8 \div 2$ ,  $5400 \div 60 = 540 \div 6$



$3500 \div 250$  was calculated by Ripa, Sumon and Sohag with the simple method. Let's explain their ideas.

(1) Ripa



$$\begin{array}{rcl}
 3500 & \div & 250 \\
 \downarrow 10 & & \downarrow 10 \\
 350 & \div & 25 = 14
 \end{array}$$

(2) Sumon



$$\begin{array}{rcl}
 3500 & \div & 250 \\
 \downarrow 10 & & \downarrow 10 \\
 350 & \div & 25 \\
 \downarrow 7 & & \downarrow 5 \\
 70 & \div & 5 = 14
 \end{array}$$

(3) Sohag



$$\begin{array}{rcl}
 3500 & \div & 250 \\
 \downarrow 10 & & \downarrow 10 \\
 350 & \div & 25 \\
 \downarrow 4 & & \downarrow 4 \\
 1400 & \div & 100 = 14
 \end{array}$$

- 1 Using the properties of division, try the following calculation and compare your idea with your friends

(1)  $250 \div 50$  (2)  $8100 \div 900$   
 (3)  $150 \div 25$  (4)  $700 \div 25$



Let's do the calculation to check whether the following method is correct or not.

If we divide a number by 10 or 100 by the simple method, we put comma after as many digits from the right of the dividend as the number of zeroes on the right side of the divisor. Then the number of the left of the comma of the dividend will be quotient and the number on its right side will be remainder.

$734 \div 10$	$73\overline{)4}$	$10$	$ $	$987 \div 100$	$9\overline{)87}$	$100$
	quotient	remainder			quotient	remainder

- 2 Now let's do the following exercise with the above method.

(1)  $876 \div 10$  (2)  $1234 \div 10$  (3)  $765 \div 100$  (4)  $9765 \div 100$

## 4.5 Exercise

1. Divide :

(1) $60 \div 30$	(2) $90 \div 40$	(3) $240 \div 30$	(4) $310 \div 40$
(5) $45 \div 15$	(6) $92 \div 46$	(7) $83 \div 41$	(8) $99 \div 28$
(9) $168 \div 42$	(10) $455 \div 73$	(11) $224 \div 28$	(12) $141 \div 27$
(13) $837 \div 27$	(14) $691 \div 16$	(15) $928 \div 43$	(16) $764 \div 25$
(17) $2795 \div 13$	(18) $3030 \div 14$	(19) $1674 \div 18$	(20) $9316 \div 32$

2. Do calculation with the simple method.

(1) $7600 \div 200$	(2) $7200 \div 900$
(3) $100000 \div 1000$	(4) $350 \div 25$



## Division

3 Fill in the blank boxes

(1)

$$\begin{array}{r} 2 \\ 3 \square \overline{) 69} \\ \underline{\square 8} \\ 1 \end{array}$$

(2)

$$\begin{array}{r} 2 \square \\ 1 \square \overline{) 29 \square} \\ \underline{28} \\ 1 \square \\ \underline{14} \\ 3 \end{array}$$

(3) Challenge!

$$\begin{array}{r} \square \square \\ \square 3 \overline{) 4 \square 0} \\ \underline{46} \\ \square 0 \\ \underline{0} \\ 10 \end{array}$$

- 4 The quotient becomes 3 and remainder is 10 when we divide a certain number by 34. What is the number?
- 5 There are 99 children. You are making team of 11 to play football games. How many teams can you make?
- 6 You want to divide 182 postcards equally among 26 people. How many postcards should you give each person?
- 7 There are 500 pencils. We're putting 12 of them in each box. How many boxes do we need and how many pencils will remain?
- 8 A wire of 1716 meters in length is divided into 78 equal parts. What is the length of each part?
- 9 The price of 85 Kg rice is Tk. 2295. What is the price of 1 kg rice?
- 10 You have 2784 beads. You need 98 beads to make a garland. How many garlands can you make with them?



## Problems related to Four Basic Operations

### 5.1 Mathematical Sentence and Calculation Order



Let's be familiar with mathematical sentences and learn calculation order!



Sohel bought a chicken for Tk. 230, later he also bought pulse for Tk. 60 and vegetables for Tk. 40. Write a mathematical sentence to calculate the total cost and solve it.

Let's try to express the situation in a single mathematical sentence.



Mathematical sentence:



Let's see these ideas, compare the mathematical sentences and explain how Hasan and Shula thought to solve the problem.



Hasan

$$230 + 60 + 40 = 330$$

Taka 330



Shula

$$230 + (60 + 40) = 130 + 100 = 330$$

Taka 330

How interesting! mathematical sentences tell us how a person thinks about solving the problem.



The answer is the same whether you add the numbers one by one or in group. You can use bracket '{ }' to show you are calculating by grouping. **In general, we calculate from left to right, but calculate the numbers inside the bracket first** when we have the bracket.

$$230 + 60 + 40$$

$$230 + (60 + 40)$$

## Problems related to Four Basic Operations



Rita had taka 820. She gave her daughter taka 260 and her son taka 240. Write a mathematical sentence to calculate how much she has now and solve it.

Mathematical sentence:



Let's compare the ideas of Mitu and Sabuj and explain how they thought.



**Mitu's idea**

$$\begin{aligned} 820 - 260 - 240 \\ = 560 - 240 \\ = 320 \end{aligned}$$

Taka 320



**Sabuj's idea**

$$\begin{aligned} 820 - (260 + 240) \\ = 820 - 500 \\ = 320 \end{aligned}$$

Taka 320

The answer is the same whether you subtract the numbers one by one or in group inside the bracket to add first and subtract. In case of subtraction, you need to be careful about calculation inside the bracket because it's addition.



There are 2 trays and each has 4 plates on it. I have put 3 piasus in each plate. Write a mathematical sentence to calculate how many piasus are there in 2 trays and solve it.



Mathematical sentence:



**Kazol's idea**

$$\begin{aligned} 3 \times 4 \times 2 \\ = 12 \times 2 \\ = 24 \end{aligned}$$

24 piasus



**Aminul's idea**

$$\begin{aligned} 3 \times (4 \times 2) \\ = 3 \times 8 \\ = 24 \end{aligned}$$

24 piasus



Kazol finds the number of piasu on one tray ( $3 \times 4$ ) first, right?

Aminul thinks about the number of plates ( $4 \times 2$ ), firstly



Sometimes, these rules enable us to calculate easier. Let's try to do the next exercise.



1 Calculate and compare the answers

- |  |  |
|--|--|
| (1) $\begin{cases} 128 + 92 + 8 \\ 128 + (92 + 8) \end{cases}$                     | (2) $\begin{cases} 376 + 181 + 19 \\ 376 + (181 + 19) \end{cases}$               |
| (3) $\begin{cases} 657 - 64 - 36 \\ 657 - (64 + 36) \end{cases}$                   | (4) $\begin{cases} 928 - 375 - 125 \\ 928 - (375 + 125) \end{cases}$             |
| (5) $\begin{cases} 37 \times 20 \times 50 \\ 37 \times (20 \times 50) \end{cases}$ | (6) $\begin{cases} 78 \times 25 \times 4 \\ 78 \times (25 \times 4) \end{cases}$ |

2 Express the following problems in a single mathematical sentence and solve it.

- (a) The price of a pencil box is Tk. 150. How many pencil boxes can you purchase by Tk. 750?

Mathematical sentence \_\_\_\_\_

The answer \_\_\_\_\_

- (b) A box contains a bat of Tk. 100 and a ball of Tk. 50. How many boxes can you purchase by Tk. 750?

Mathematical sentence:

The answer \_\_\_\_\_

3 Make your own story for Mathematical sentences below and solve them

(1)  $200 + (150 + 70)$

(2)  $100 - (10 + 60)$

My story is this.

In our garden, we have 200 Rose plants. Now my mother plants 150 and my father plants 70 more. How many rose plants do we have now?



## Problems related to Four Basic Operations



Let's try to make general mathematical sentence using '( )' for each of the following problem

- (a) The price of a *Singara* is Tk. 6 and I have a 100 taka note. How much will be the change if I buy ten *Singaras*?

$$\boxed{\phantom{000}} - (\boxed{\phantom{00}} \times \boxed{\phantom{00}})$$

- (b) The price of a Hilsha fish is Tk. 300 and a pair of pigeon is Tk 200. How much will be the cost if I buy one Hilsha fish and one pigeon?

$$\boxed{\phantom{000}} + (\boxed{\phantom{00}} + \boxed{\phantom{00}})$$

- (c) The price of a cabbage is Tk. 25 and a pumpkin is Tk. 60. How much will be the cost of 2 cabbages and 3 pumpkins?

$$(\boxed{\phantom{00}} \times \boxed{\phantom{00}}) + (\boxed{\phantom{00}} \times \boxed{\phantom{00}})$$

When you solve both addition or subtraction and multiplication or division in the same Mathematical sentence, the rule is that you must calculate the multiplication or division first. (But in multiplication and division, you must calculate from left to right.)

With this rule, we don't have to use '( )' in the Mathematical sentences above. We can rewrite them like this:

$$(a) 100 - (10 \times 6) \quad \Rightarrow \quad 100 - 10 \times 6$$

$$(b) 300 + (200 \div 2) \quad \Rightarrow \quad 300 + 200 \div 2$$

$$(c) (25 \times 2) + (60 \times 3) \quad \Rightarrow \quad 25 \times 2 + 60 \times 3$$

4 Calculate them.

Be careful about the order of the calculation.

(1)  $6 + 12 \times 5$

(2)  $300 - 150 \div 50$

(3)  $200 - 25 \times 4$

(4)  $60 + 30 \div 6$







(b)  $9 - 8 \div 4 \times 2$

(c)  $9 - (8 - 4 \times 2)$



(b)  $9 - 8 \div 4 \times 2 = 9 - 2 \times 2$   
 $\quad \quad \quad 1 \quad \quad \quad | = 9 - 4$   
 $\quad \quad \quad 2 \quad \quad \quad = 5$



- In general, calculate from left to right.
- If there are both  $+$  or  $-$  and  $\times$  or  $\div$ , calculate the  $\times$  or  $\div$  first.
- If there is  $( )$ , calculate inside the  $( )$  first.



(2)  $16 - (4 + 2)$

(4)  $16 \div (4 \div 2)$

(6)  $(16 \div 4) \div 2$

## 5.2 Rules and Ideas for Calculation



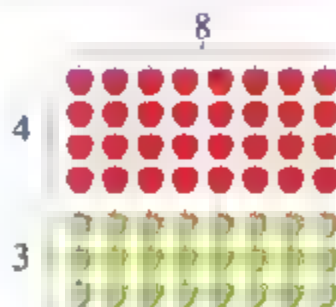
Let's get the new rules and ideas for calculation



There are some red apples and green apples. How many are there in total?



We can solve it in many ways.



Dipika's idea

$$(4 + 3) \times 8 = 56$$

56 apples



Shaymol's idea

$$4 \times 8 + 3 \times 8 = 56$$

56 apples

We get the same answers for both Mathematical sentences. Even though Mathematical sentences are different, you can connect them with equal sign as long as the answers are equal on both sides.

$$(4 + 3) \times 8 = 4 \times 8 + 3 \times 8$$

Here are some rules for Mathematical sentences which use ( ).

$$(\square + \triangle) \times \bullet = \square \times \bullet + \triangle \times \bullet$$

$$(\square - \triangle) \times \bullet = \square \times \bullet - \triangle \times \bullet$$

It can be verified by putting different numbers in place of  $\square$ ,  $\triangle$  and  $\bullet$ .



1 Following the above rules calculate to make sure that both Mathematical sentences are same :

(a)  $(135 - 35) \times 7$

(b)  $135 \times 7 - 35 \times 7$



Use calculation rules to get the answer

(1)  $25 \times 32$

Remember the fact.  $25 \times 4 = 100$   
If you can find 4, it'll be very easy.



$$25 \times 32 = 25 \times (4 \times 8)$$

$$= (\quad \times \quad) \times 8$$

$$= (\quad) \times 8$$

$$= \quad$$

(2)  $99 \times 9$

I know that ' $99 = 100 - 1$ '  
Let's use this!  
If you can find 4, it'll be very easy.



$$99 \times 9 = (100 - 1) \times 9$$

$$= \quad \times 9 - \quad \times 9$$

$$= \quad - \quad$$

$$= \quad$$

2

Find an alternative easier way to calculate the following. Explain your idea in your notebook

(1)  $25 \times 16$

(2)  $24 \times 25$

(3)  $50 \times 18$

(4)  $98 \times 5$

(5)  $102 \times 11$

(6)  $999 \times 9$

3

Solve it by using calculation rules.

(1) Bidhan Tripura bought five water melons of taka 98 each.  
How much did it cost?

(2) Maya has 36 small bags. Each bag has 25 olives.  
How many olives does she have in total?

### 5.3 Exercise

1 Calculate applying the rules for calculation order.

(1)  $7 \times 8 - 6 \div 2$       (2)  $7 \times (8 - 6 \div 2)$

(3)  $(7 \times 8 - 6) \div 2$       (4)  $7 \times (8 - 6) \div 2$

2 Use the calculation rules to calculate the following

(1)  $724 + 87 + 13$       (2)  $624 - 76 - 24$

(3)  $20 \times (66 \times 50)$       (4)  $4 \times 92 \times 25$

(5)  $32 \times 25$       (6)  $97 \times 8$

3 Express the situation in a single mathematical sentence and solve it.

(1) Price of 5 pencils is taka 60. How much is the price of 9 pencils?

(2) Divisor is 3 times the remainder and the quotient is 4 times the divisor. Remainder is 2. What is the dividend?

(3) Monthly salary of Ms Shampa is taka 7500. She spends taka 7250 every month. How much money does she save in a year?

4 Rupa and Moni have taka 875 together. Moni has taka 125 more than that of Rupa. How much money do they have separately?

5 The sum of the age of father and son is 55 years. Father's age is 4 times more the son's. How old are they individually?

6. Price of 4 hens and 3 ducks together is taka 639. Price of 1 duck is taka 85. What is the price of 1 hen?



7 Make your own story for Mathematical sentences below and solve them

(1)  $200 - (10 \times 8)$

(2)  $(6 \times 8) + (12 \times 2)$

## Chapter Six

# Mathematical Symbols

## 6.1 Mathematical Symbols



Let's learn mathematical symbols.



Let us look at following mathematical sentences. These are formed by various mathematical symbols. Try to classify them.

$$2 + 3$$

$$30 \div 5 + 8$$

$$7 - 6 = 1$$

$$4 \times 6 < 26$$

$$35 + 5 \neq 2 \times 3$$

$$8 \times 7 \neq 55$$

$$35 \neq 53$$

$$9 \times 6 > 45$$

Mathematical symbols are classified as shown below.

Symbols used for writing down the numbers are called:

**Numeral Symbols**

0, 1, 2, 3, 4, 5, 6, 7, 8 and 9

Symbols used for basic four operations are called:

**Operation Symbols**

+, -,  $\times$  and  $\div$

Symbols used to indicate the mutual relation are called.

**Relation Symbols**

=, >, <,  $\neq$ ,  $\nlessgtr$  and  $\leq$



We have to be careful about the names of the **Relation Symbols**.

= equal

> greater than

< smaller than

$\neq$  not equal

$\nlessgtr$  not greater than

$\leq$  not smaller than

## Mathematical Symbols

1 Express the following by using the mathematical symbols.

- (1) Forty-seven is not greater than ninety-six.
- (2) Nine hundred and nine is not equal to nine thousand and nine.
- (3) Twenty-five is not less than twenty-four.

2 Put '=' or '≠' in the blank boxes.

- (1)  $3 \times 5$   15
- (2)  $24 + 12$   3

3 Put '<' or '>' in the blank boxes.

- (1) 73  37
- (2)  $20 + 9$   30



Put the appropriate **relation symbols** in the blank box

- (1)  $6 + 2 \times 4$    $(6 + 2) \times 4$
- (2)  $52 - 15 + 13$    $52 - (15 - 13)$

Let's calculate the left and right side of the relation symbols separately and compare them.

(1)	[left side]	[right side]
	$6 + 2 \times 4$	$(6 + 2) \times 4$
	$= 6 + 8$	$= 8 \times 4$
	<u>14</u>	<u>32</u>

$$14 < 32$$

$$\therefore 6 + 2 \times 4 < (6 + 2) \times 4$$

(2)	[left side]	[right side]
	$52 - 15 + 13$	$52 - (15 - 13)$
	$= 37 + 13$	$= 52 - 2$
	<u>50</u>	<u>50</u>

$$50 = 50$$

$$\therefore 52 - 15 + 13 = 52 - (15 - 13)$$

'∴' is a symbol which means 'therefore.'

Can we use any other symbols which are related to these examples?

4 Put the appropriate relation symbols in the blank box

- (1)  $142 - 65$    $57 + 12$
- (2)  $63 \div 7 \times 5$    $63 \times 5 \div 7$





## 6.2 'True' or 'False' with Mathematical Sentences



Let's study 'true' and 'false' with mathematical sentences.



The following are all mathematical sentences. Which one is true and which one is false?

(a)  $15 + 7 = 22$

(b)  $12 \div 5 = 5$

(c)  $6 \times 3 = 2 \times 9$

(d)  $3 \times 12 < 30 + 2$



Compare the left side and the right side of the relation symbols carefully.

(a)  $\begin{array}{|c|} \hline \text{[left side]} \\ \hline 15 + 7 \\ \hline = 22 \\ \hline \end{array} = \begin{array}{|c|} \hline \text{[right side]} \\ \hline 22 \\ \hline \end{array} \quad \therefore \text{true sentence}$   
Because 22 is equal to 22.

(b)  $\begin{array}{|c|} \hline 12 \div 5 \\ \hline = 2, R2 \\ \hline \end{array} = \begin{array}{|c|} \hline 5 \\ \hline \end{array} \quad \therefore \text{false sentence}$   
Because quotient 2 and remainder 2 are **not** equal to 5.

(c)  $\begin{array}{|c|} \hline 6 \times 3 \\ \hline = 18 \\ \hline \end{array} = \begin{array}{|c|} \hline 2 \times 9 \\ \hline = 18 \\ \hline \end{array} \quad \therefore \text{true sentence}$   
Because 18 is equal to 18.

(d)  $\begin{array}{|c|} \hline 3 \times 12 \\ \hline = 36 \\ \hline \end{array} < \begin{array}{|c|} \hline 30 + 2 \\ \hline = 32 \\ \hline \end{array} \quad \therefore \text{false sentence}$   
Because 36 is **greater** than 32.

**Mathematical sentence may be true or false.**

## Mathematical Symbols

- 1 Look at the following mathematical sentences. Which one is true and which one is false?

(a)  $46 - 7 = 40$

(b)  $18 \div 9 \times 2$

(c)  $12 \times 5 \neq 120 \div 2$



Is following mathematical sentence 'true'?

$$\square + 9 = 15$$

This time, it's a little bit complicated, isn't it?



[left side]

[right side]

$$\square + 9$$

=

$$15$$

true sentence?

false sentence?

???

Regarding the mathematical sentence above, we cannot say it's true or false immediately. It may be true or false. So it's open. Such a mathematical sentence is called open sentence.

Whether the open sentence is 'true' or 'false' depends on the values that are used.



In this case, if 6 is put in  $\square$ , the mathematical sentence will be true. And if another number is put, the mathematical sentence will be false.

$$6 + 9 = 15 \quad \text{true sentence}$$

$$5 + 9 = 15 \quad \text{false sentence}$$

This  $\square$  can take any value. Whether the mathematical sentence is true or false depends on the value which is put in the  $\square$ .

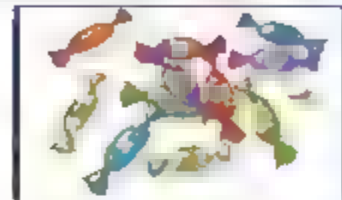
### 6.3 Mathematical sentences with



Let's make and solve mathematical sentences with



Mukta has some candies and Apu has 6 candies. The total number of the candies they have is 18.



- (1) Write a mathematical sentence for above statement, assuming that Mukta has  number of candies.
- (2) Find the unknown number to be filled in the .

(1) The mathematical sentence should be  $\square + 6 = 18$

(2) The unknown number to be filled in the  should be

We can calculate it by putting different numbers in the blank boxes.

$$\square 10 + 6 = 18 \quad \times$$

$$\square 11 + 6 = 18 \quad \times$$

$$\square 12 + 6 = 18 \quad \checkmark$$

$$\square 13 + 6 = 18 \quad \times$$

We can solve it using the relation between addition and subtraction.

$$\begin{aligned} \square &= 18 - 6 \\ &= 12 \end{aligned}$$



$$\square = 12$$



- 1 There were 21 Plums. Some of the Plums were eaten by some friends and 14 of them remained.

- (1) Write a mathematical sentence assuming the number of Plums eaten are  pieces.
- (2) Find the unknown number.

## Mathematical Symbols



32 pieces of Ruti are divided equally among some people and each person gets 8 pieces.

- (1) Write a mathematical sentence assuming the number of people is .
- (2) Find the unknown number

(1) The mathematical sentence should be:  $32 \div \square = 8$

(2) Unknown number to be filled in for  should be:

We can calculate it by putting different numbers in the blank boxes.

$$32 \div \boxed{2} = 8 \quad \times$$

$$32 \div \boxed{3} = 8 \quad \times$$

$$32 \div \boxed{4} = 8 \quad \checkmark$$

$$32 \div \boxed{5} = 8 \quad \times$$



We can solve it using the way of checking answers of division:

$$8 \times \square = 32$$

And to solve this, we can do:

$$\begin{aligned} \square &= 32 \div 8 \\ &= 4 \end{aligned}$$



$$\square = 4$$



- 2 ✨ Write mathematical sentences of the following statements using  as the unknown numbers and find the value of .

(1) 12 is added to a number so that their sum becomes 180.

(2) A number is multiplied by 15 so that their product becomes 270.

## 6.4 Exercise

1. Put a relation symbol in the blank boxes so that the obtained statement can be true.

(1)  $87 + 13$    $108 - 19$

(2)  $267 - 25 - 27$    $267 - (25 + 27)$

(3)  $343 \div 7 \div 7$    $343 \div (7 \times 7)$

2. Verify which of the following statements are true and which are false.

(1)  $76 - 34 + 30 = 76 - (34 - 30)$

(2)  $200 - 25 \times 4 \neq (200 - 25) \times 4$

(3)  $32 \div 4 \div 2 \neq 32 \div (4 \div 2)$

(4)  $3 \times 6 + 4 \times 2 = 3 \times (6 + 4) \times 2$

3. Put such an operational sign in the blank boxes so that the obtained statement can be true.

(1)  $69$    $13 = 7$    $8$

(2)  $58$    $29 = 96$    $9$

(3)  $8$    $5 = 1200$    $30$

(4)  $87$    $38 = 7$    $7$

4. Put such a number in each of the following open sentences so that the obtained statement can be true.

(1)   $+ 9 = 49 - 15$

(2)  $9 \times$    $= 36 \times 2$

(3)  $81 \div$    $= 27 \div 3$

(4)  $3 + 8 \times$    $= 35$

5. Express the following questions by using  and find the unknown number.

(1) A number is divided by 7. Quotient is 5 and remainder is 4.

(2) 7 is multiplied by the sum of a number and 3. And product is 56.

## Chapter Seven

# Multiples and Factors

## 7.1 Multiples and Common Multiple



Let's learn about multiples



In the shop, boxes which contain cookies and chocolates are piled up separately



The height of the each box containing cookies is 3 cm

Let's find the relation between the number of the boxes and the total height of them when we pile up the boxes.

Number of the boxes	1	2	3	4	5	6	7
Total height (cm)	3	6	9	12			

The numbers like 3, 6, 9, and 12 are formed by multiplying a number by 3. They are called **multiples of 3**. Multiples of 3 are divisible by 3.



The multiples of 3 are,  
 $3 \times 1 = 3$ ,  $3 \times 2 = 6$ ,  $3 \times 3 = 9$ ,  
and many more.

multiples of 3

3	6	9	12
15	18	21	
24	27	30	
33	36...		

When we talk about multiples, we usually do not include multiples of 0 or numbers multiplied by 0.





- 1 Circle multiples of 2 on the number line below. And also circle multiples of 3, multiples of 4 and multiples of 5 on the number line. (Some have been done for you)



- 2 Which numbers in the box below are the multiples of 7?

7 16 21 32 65 84

Remember that multiples of 7 are divisible by 7.



- 3 The height of the boxes which contain chocolates is 4 cm. When we pile up the boxes, how should we call the numbers for expressing the total height?

4 8 12 16 20  
24 28 32 36  
40 44 48...

- If we keep piling up the cookies boxes with the height of 3 cm and chocolate boxes with the height of 4 cm separately, when does the height of both piled boxes become equal?



multiples of 3					multiples of 4				
3	6	9	15	12	4	8	14	20	
18	21	27	30	24	28	32	40		
33	39			36...	44				



Wow, we can find the answer using multiples of both 3 and 4.

Answer: The height is equal when the height of both pills becomes 12, 24, 36.

Numbers that are multiples of both 3 and 4 are called **common multiples** of 3 and 4.

The **common multiples** of 3 and 4 are 12, 24, 36, and many more



Let us find the common multiples of 6 and 8.

Let's compare these two ideas.



Meenam:

Multiples of 6: 6, 12, 18, 24, 30, 36, 42, 48...

Multiples of 8: 8, 16, 24, 32, 40, 48, 56, 64, 72...

Firstly, I will list the multiples of 6 and multiples of 8, and then find out the numbers that are the same.



Tamim:

Multiples of 8: 8, 16, 24, 32, 40, 48, 56, 64, 72...

Multiples of 6: × × ✓ × × ✓ × × ✓

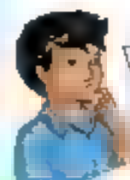
I have found out the multiples of 6 in a list of multiples of 8.

Answer: The common multiple of 6 and 8 are 24, 48, 72 and many more

The smallest common multiple is called the **least common multiple (LCM)**. The least common multiple of 6 and 8 is 24

- 4 List 3 common multiples for the following pairs of numbers, ordering them from the smallest. And also write the least common multiples (LCM).

(1) 2, 3 (2) 4, 5 (3) 10, 5 (4) 3, 7



By the way, can we also find common multiples for sets of 3 numbers?

Yes, by the same method. Let us try it on the next page





Find common multiples and the least common multiple (LCM) for 2, 3, and 4.



Multiples of 2: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24..  
 Multiples of 3: 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36..  
 Multiples of 4: 4, 8, 12, 16, 20, 24, 28, 32, 36, 40...



Multiples of 4: 4, 8, 12, 16, 20, 24, 28, 32, 36, 40..  
 Multiples of 3: × × ✓ × × ✓ × × ✓ ×  
 Multiples of 2: × × ✓ × × ✓ × × ✓ ×



Can everyone explain how to do it?

Which method do you think is easier?



Answer: Common multiples for 2, 3, and 4 are 12, 24, 36 and many more

Least common multiple (LCM) of 2, 3, and 4 is 12

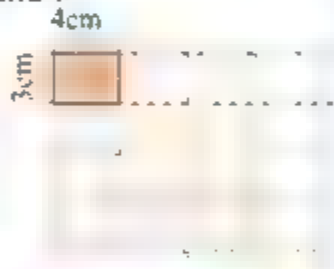
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Find the least common multiple (LCM) of the following.

(i) 4, 6, and 9 (2) 4, 8, and 12 (3) 4, 5, and 6



We want to arrange rectangular tiles of 4 cm long and 3 cm wide like the figure on the right to make the smallest square possible. How many centimeters will be one side of the square?



The multiples of width are 3, 6, 9, 12... and the multiples of length are 4, 8, 12, 16...

It's going to be the least common multiple (LCM) of 3 and 4.



Multiples of 4: 4, 8, 12, 16, 20, ..

Multiples of 3: × × ✓

Answer: The side of the smallest square is 12 cm.

## 7.2 Factors and Common Factors



Let's learn about factors



We want to put 12 candies on some plates by dividing them equally. How many plates do you need if you do not keep any candy with you?



Let's find the answer by putting the candies on 1 plate and then keep going from 2 plates to 12 plates one by one.

Number of plates	1	2	3	4	5	6	7	8	9	10	11	12
Without Remaining:	✓	✓	✓	✓	✗							
With remaining:	✗	✓	✓		✗							

If we have 1 plate, we can put 12 candies on it.

If we have 2 plates, we can put 6 candies each.

If we have 5 plates, we can put 2 candies each but 2 are left.

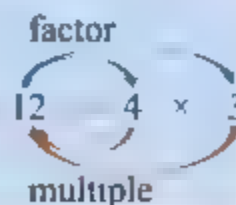
Answer: We can put the candies on 1, 2, 3, 4, 6, 12 plates without keeping any remaining.

The numbers that can divide 12 evenly are called the **factors of 12**.  
 The number 12 has 6 factors:  
 1, 2, 3, 4, 6, and 12.  
 1 and the number itself are included in its factors.



I find relation between factors and multiples.  
 For example:

3 and 4 are the **factors** of 12,  
 and 12 is the **multiple** of 3 and 4



I also find relation among each factor.

1 2 3 4 6 12

Each factor has pairs of whose product is 12



Find and check the factors. Then exchange what you notice with your friends.

Factors of 4	✓ ✓ ✓ 1 2 3 4
Factors of 5	1 2 3 4 5
Factors of 6	1 2 3 4 5 6
Factors of 7	1 2 3 4 5 6 7 8
Factors of 13	1 2 3 4 5 6 7 8 9 10 11 12 13
Factors of 16	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Factors of 18	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

Basically, you need to start by 1 and then go on with 2 and so on. But finding the pair of factors we can find all the factors without omission.



Factors of 18	✓ ✓ ✓ ✓ ✓ ✓ ✓ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
---------------	---



Find all the factors.

(1) 7 (2) 9 (3) 10 (4) 24 (5) 36

## Multiples and Factors



We have to divide 12 candies and 18 pieces of chocolate into equal numbers and put them on the same plates. How many plates are needed to put candies or pieces of chocolate without having any remaining?

If we have 1 plate, we can put 12 candies and 18 pieces of chocolate on it.

If we have 2 plates, we can put 6 candies and 9 pieces of chocolate each...



Oh, it's a question of factors! Let's find factors of 12 and 18.

Factors of 12	✓	✓	✓	✓		✓						✓						
	1	2	3	4	5	6	7	8	9	10	11	12						
Factors of 18	✓	✓	✓			✓			✓								✓	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

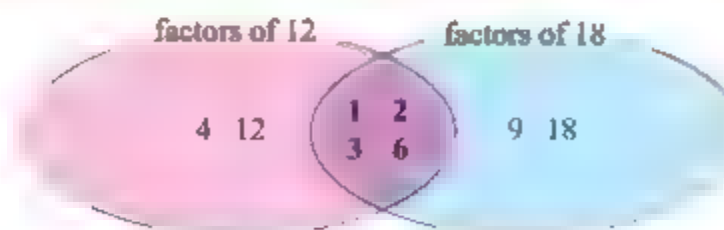
If we have 3 plates, we can put 4 candies and 6 pieces of chocolate each.

If we have 4 plates, we can put 3 candies and 4 chocolates in each plate. But there will remain some chocolates.

Answer We can arrange candies and chocolates on 1, 2, 3 and 6 plates without having any remaining.

The numbers that are factors of both 12 and 18 are called the **common factors of 12 and 18**.

The common factors of 12 and 18 are 1, 2, 3, and 6.







Find the common factors of 24 and 36

Let's compare these two ideas and explain how to do it.



Mukta



Factors of 24: ① ② ③ ④ ⑥ 8, ⑫, 24

Factors of 36: ① ② ③ ④ ⑥ 9, ⑫, 18, 36

David



Factors of 24: 1, 2, 3, 4, 6, 8, 12, 24

Factors of 36: ✓ ✓ ✓ ✓ ✓ × ✓ ×

Answer: The common factors of 24 and 36 are 1, 2, 3, 4, 6 and 12.

The largest common factor of two numbers is called the **highest common factor (HCF)**.

The highest common factor of 24 and 36 is 12



Find the common factors and the highest common factor (HCF).

(1) 4, 15

Factors of 4: ① 2, 4

Factors of 15: ① 3, 5, 15

Factors of 4: 1, 2, 4

Factors of 15: ✓ × ×

Both of the numbers have only one common factor which is 1.

(2) 9, 27

Factors of 9: ① ③ ⑨

Factors of 27: ① ③ ⑨ 27

Factors of 9: 1, 3, 9

Factors of 27: ✓ ✓ ✓

In this case, 9 itself is the highest common factor (HCF) of 9 and 27!

2 List all the common factors and find the highest common factors (HCF).

(1) 12, 20

(2) 5, 8

(3) 28, 42

(4) 8, 16, 20

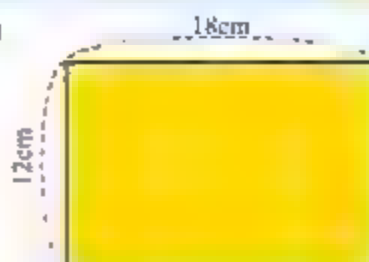
(5) 15, 18, 30

(6) 12, 36, 60

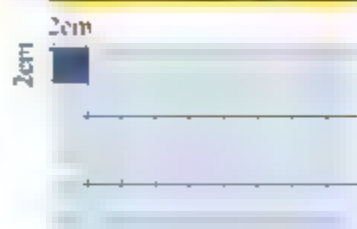
## Multiples and Factors



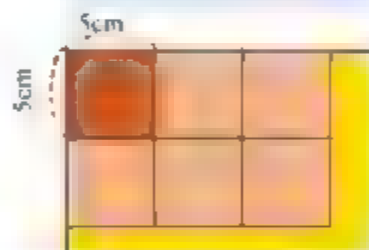
I have a piece of paper which is 18 cm long and 12 cm wide and I want to spread squares of the same size all over the surface of the paper.



(1) Is it possible to spread squares whose side is 2cm all over?



(2) Is it possible to spread squares whose side is 5cm all over?



(3) What relation is there between 12, 18 and the length of the side of the square?



12 is divisible by the length of the side of the square.

And 18 is also divisible by the same length



(4) List all the possible lengths of the side of the square



We list the common factors of 12 and 18, right?

Factors of 12: ① ② ③ 4, ⑥ 12

Factors of 18: ① ② ③ ⑥, 9, 18

Factors of 12: 1, 2, 3, 4, 6, 12

Factors of 18: ✓✓✓×✓×

(5) How long is the length of the side of the biggest possible square?

In this question, the highest common factor (HCF) is very important.



## 7.3 Prime Numbers



Let's learn about Prime Numbers

As the right table shows, 2, 3, 5, 7 have **only 1 and themselves as their factors**.

These numbers are called **prime numbers**. 1 is not considered a prime number.

Numbers that are neither 1 nor prime numbers are called **composite number**.

Factors of 18	✓	✓					
	1	2					
Factors of 18	✓		✓				
	1	2	3				
Factors of 18	✓				✓		
	1	2	3	4	5		
Factors of 18	✓						✓
	1	2	3	4	5	6	7



Let's find prime numbers up to 100

1. Cross out 1.
2. Circle 2. Cross out all multiples of 2 that are larger than 2 itself.
3. Circle 3. Of the remaining numbers, cross out all multiples of 3 that are larger than 3 itself.
4. Continue in this way until all the remaining numbers are crossed out.



Let's do a continuance by ourselves!

We don't have to cross out the multiples of 4 because they are also the multiples of 2.



1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Prime numbers up to 100 are as follows:

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47,  
53, 59, 61, 67, 71, 73, 79, 83, 89, 97

### Why do we study Prime and Composite Numbers?

Because we are able to 'break apart' composite numbers into prime number factors (**prime factors**). In other words, composite numbers can be made up by multiplication of prime numbers.

The prime numbers are the basic building blocks of all numbers.

[Example]



2, 3, 5, 7, and 11 are prime numbers.

$$4 = 2 \times 2 \quad 12 = 2 \times 2 \times 3 \quad 20 = 2 \times 2 \times 5 \quad 42 = 2 \times 3 \times 7$$

$$81 = 3 \times 3 \times 3 \times 3 \quad 210 = 2 \times 3 \times 5 \times 7 \quad 385 = 5 \times 7 \times 11$$

These composite numbers are made up by multiplication of prime numbers



Put 2, 3 or 5 in the blank to make the following composite numbers.

(1)  $6 = \square \times \square$

(2)  $8 = \square \times \square \times \square$

(3)  $18 = \square \times \square \times \square$

(4)  $30 = \square \times \square \times \square$

# Let's try! divisibility of 2, 3, and 5 —



Let's try to predict divisibility of the numbers



Find the numbers which are divisible by 2. Firstly, let's predict it. Then do division to check it.

a) 224   b) 1146   c) 2283   d) 135798

We can distinguish by looking at the number of ones place.

If there is a 0, 2, 4, 6, or 8 in the ones place, the number is a **multiple of 2**. So they are divisible by 2.



Find the numbers which are divisible by 5.

a) 555   b) 354   c) 2230   d) 24685

This time, how do we find the rule?

If there is a 0 or 5 in the ones place, those numbers are a **multiple of 5**. So they are divisible by 5.



Choose the number which is divisible by 3.

a) 261

b) 262

c) 263

$$\begin{array}{r} 87 \\ 3 \overline{) 261} \\ \underline{24} \phantom{0} \\ 21 \\ \underline{21} \\ 0 \end{array}$$

$$\begin{array}{r} 87 \\ 3 \overline{) 262} \\ \underline{24} \phantom{0} \\ 22 \\ \underline{21} \\ 1 \end{array}$$

$$\begin{array}{r} 87 \\ 3 \overline{) 263} \\ \underline{24} \phantom{0} \\ 23 \\ \underline{21} \\ 2 \end{array}$$

There is a strange rule here.

$2+6+1=9$   
 $9-3=3$   
It's a multiple of 3.

$2+6+2=10$   
 $10-3=3R1$   
It's not a multiple of 3.

$2+6+3=11$   
 $11-3=3R2$   
It's not a multiple of 3.

If the sum of the digits of each place is a **multiple of 3**, the number is a multiple of 3. So it is divisible by 3.

## 7.4 Exercise

- 1 List 3 multiples for the following numbers, ordering them from the smallest

(1) 4      (2) 7      (3) 11      (4) 14

- 2 List 3 common multiples for the following pairs of numbers, ordering them from the smallest. And also write the least common multiples (LCM).

(1) 3, 4      (2) 4, 9      (3) 3, 9      (4) 5, 8

3. List all the factors of the following numbers.

(1) 9      (2) 12      (3) 24      (4) 30

- 4 List all the common factors of the following numbers. And also write the highest common factors (HCF) for each pair.

(1) 9, 15      (2) 14, 21      (3) 24, 40      (4) 5, 9

5. Find the least common multiples (LCM) and highest common factors (HCF) for each.

(1) 8, 12, 24      (2) 9, 12, 18

6. Put 2, 3 or 5 in the blank to make any composite number.

(1)  $\square \times \square \times \square = \square$

(2)  $\square \times \square \times \square \times \square = \square$

(3)  $\square \times \square \times \square \times \square = \square$

7. Find multiples of 2, 3 and 5 among numbers in the box.

248, 339, 121, 515,

(1) multiples of 2 [                      ]

460, 912, 751, 555,

(2) multiples of 3 [                      ]

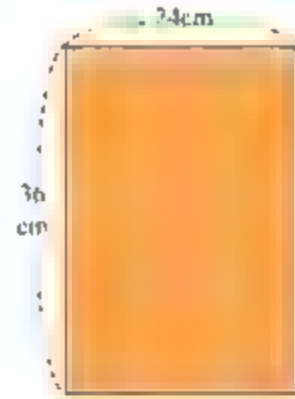
810, 951, 131, 725

(3) multiples of 5 [                      ]

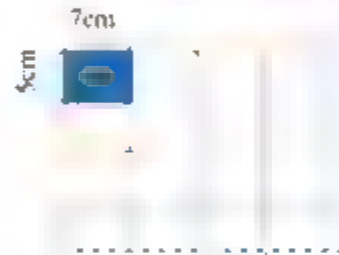


8. There are two bells. Bell A rings every 8 minutes and bell B rings every 6 minutes. The bells ring together at noon. When is the next time they will ring together?

9. I have a piece of paper of 36 cm long and 24 cm wide and I want to spread squares of the same size all over the surface of the paper. How long is the length of the side of the biggest square possible?



10. We arrange rectangular tiles of 5cm long and 7 cm wide like the figure on the right to make the smallest square possible. How many cm will be the sides of the smallest square we can make?



11. Rasel has 45 apples and 18 oranges. He wants to distribute the apples and oranges equally among the maximum number of children without keeping any remaining. Find the number of children. And how many apples and oranges will each child get?

## Chapter Eight

# Fractions

### 8.1 Common fractions with the same denominator



Let's review.

1. Colour the following.

Remember the names of the part of the fraction

$$\frac{3}{4}$$

→

←



$$\frac{1}{5} \quad \boxed{\phantom{00}} \quad \boxed{\phantom{00}} \quad \boxed{\phantom{00}} \quad \boxed{\phantom{00}} \quad \boxed{\phantom{00}}$$

$$\frac{5}{6} \quad \boxed{\phantom{00}} \quad \boxed{\phantom{00}} \quad \boxed{\phantom{00}} \quad \boxed{\phantom{00}} \quad \boxed{\phantom{00}} \quad \boxed{\phantom{00}}$$

$$\frac{3}{8} \quad \boxed{\phantom{00}} \quad \boxed{\phantom{00}} \quad \boxed{\phantom{00}} \quad \boxed{\phantom{00}} \quad \boxed{\phantom{00}} \quad \boxed{\phantom{00}} \quad \boxed{\phantom{00}}$$

2. Put the symbols '<' or '>'.

$$(1) \frac{1}{4} \square \frac{3}{4} \quad (2) \frac{2}{5} \square \frac{1}{5} \quad (3) \frac{5}{7} \square \frac{4}{7} \quad (4) \frac{8}{9} \square 1$$

3. Calculate:

$$(1) \frac{1}{3} + \frac{1}{3} \quad (2) \frac{2}{7} + \frac{4}{7} \quad (3) \frac{5}{6} + \frac{1}{6} \quad (4) \frac{3}{10} + \frac{7}{10}$$

$$(1) \frac{2}{3} - \frac{1}{3} \quad (2) \frac{7}{9} - \frac{5}{9} \quad (3) 1 - \frac{2}{3} \quad (4) 1 - \frac{7}{10}$$

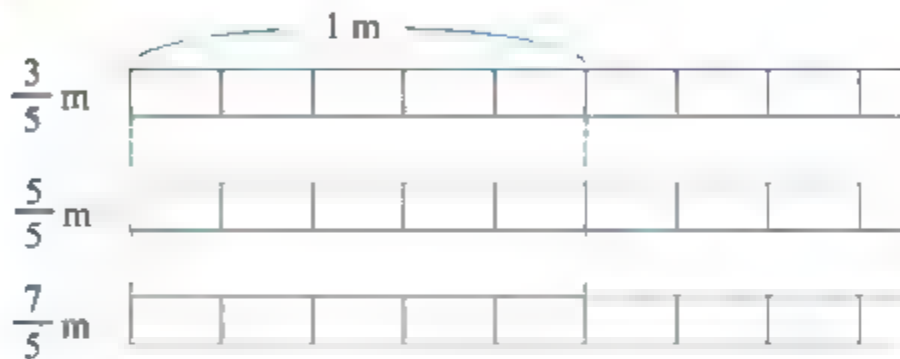
## 8.2 Fractions smaller than 1, equal to 1, and larger than 1



Let's classify fractions



Colour the following.



Fractions can be classified like this:

Fractions smaller than 1 (numerator < denominator)	Fractions equal to 1 (numerator = denominator)	Fractions larger than 1 (numerator > denominator)
Smaller $\rightarrow \frac{3}{4}$ Larger $\rightarrow \frac{4}{4}$	Equal $\rightarrow \frac{4}{4}$	Larger $\rightarrow \frac{5}{4}$ Smaller $\rightarrow \frac{4}{4}$
$\frac{3}{4}, \frac{1}{2}, \frac{2}{3}, \frac{6}{7}$ etc	$\frac{4}{4}, \frac{2}{2}, \frac{3}{3}, \frac{7}{7}$ etc.	$\frac{5}{4}, \frac{3}{2}, \frac{7}{3}, \frac{10}{7}$ etc.
<b>Proper fraction</b>	<b>Improper fraction</b>	

Fractions smaller than 1 are called **proper fractions**, while fractions equal to 1 or larger than 1 are called **improper fractions**.

In grade 4, we will mainly study **proper fraction** and **fraction equal to 1**. We are going to learn fraction larger than 1 in Grade 5.



## 8.3 Comparison of fraction



Let's find out larger fractions and smaller fractions.



Find larger or smaller Put the symbol '<' or '>'.

Colour and Compare.

(1)  $\frac{2}{5} \square \frac{3}{5}$   $\frac{2}{5}$ 


 $\frac{3}{5}$ 


(2)  $\frac{3}{8} \square \frac{5}{8}$   $\frac{3}{8}$ 


 $\frac{5}{8}$ 


Denominators of each pair are equal

(3)  $\frac{1}{2} \square \frac{1}{3}$   $\frac{1}{2}$ 


 $\frac{1}{3}$ 


(4)  $\frac{3}{5} \square \frac{3}{10}$   $\frac{3}{5}$ 


 $\frac{3}{10}$ 


Numerators of each pair are equal. What do you think?

If the **denominators are the same**, the fraction whose numerator is bigger is larger. (We studied it in Grade 3)

If the **numerators are the same**, the fraction whose denominator is smaller is larger.

- 1 ? Arrange the following from smaller to larger and show it by symbols.

(1)  $\frac{2}{3}, \frac{2}{9}, \frac{2}{8}, \frac{2}{5}$

(2)  $\frac{3}{7}, \frac{3}{10}, \frac{3}{3}, \frac{3}{5}$

(3)  $\frac{5}{10}, \frac{5}{6}, \frac{5}{15}, \frac{5}{9}$

## 8.4 Equivalent fractions



Let's find equivalent fractions and develop its idea.



Colour and Compare

$\frac{1}{2}$		
$\frac{2}{4}$		
$\frac{3}{6}$		
$\frac{4}{8}$		
$\frac{5}{10}$		

Do you find anything?



$\frac{1}{2}, \frac{2}{4}, \frac{3}{6}, \frac{4}{8}$  and  $\frac{5}{10}$  are all equivalent fractions.

$$\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8} = \frac{5}{10}$$



Using the number lines in the next page, find equivalent fractions and show it by symbol '='.

(1) Find equivalent fraction of  $\frac{1}{3}$

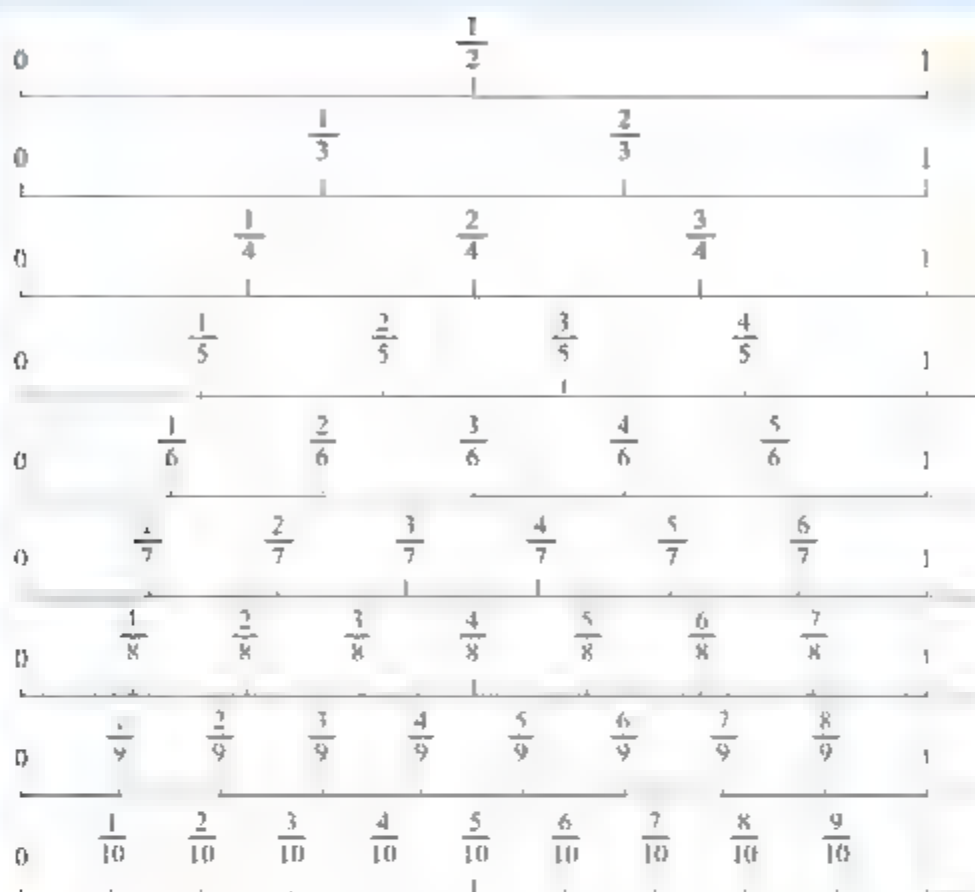
(2) Find equivalent fraction of  $\frac{2}{3}$

(3) Find other examples of equivalent fractions.

There are a lot of equivalent fractions of any fraction!



## Fractions



**2** Using the number lines, find the missing numbers.

$$(1) \frac{1}{4} = \frac{2}{\square} \quad (2) \frac{4}{10} = \frac{\square}{5} \quad (3) \frac{6}{9} = \frac{\square}{3} \quad (4) \frac{6}{8} = \frac{3}{\square}$$

Is there any method to make equivalent fractions?



Let's study about it in the next part.







Think about how to make equivalent fractions of  $\frac{1}{2}$

$$\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8}$$

Diagram showing the process of multiplying numerator and denominator by the same number to create equivalent fractions:

- $\frac{1}{2} \xrightarrow{\times 2} \frac{2}{4}$
- $\frac{1}{2} \xrightarrow{\times 3} \frac{3}{6}$
- $\frac{1}{2} \xrightarrow{\times 4} \frac{4}{8}$

Equivalent fractions can be obtained by multiplying numerator and denominator of the fraction by the same number

$$\frac{\text{red circle}}{\text{red square}} = \frac{\text{red circle} \times \text{green triangle}}{\text{red square} \times \text{green triangle}}$$

3 Find the missing numbers.

(1)  $\frac{1}{2} = \frac{\square}{12}$

Diagram showing the process of multiplying numerator and denominator by 6 to get the missing number 6 in the denominator.

(2)  $\frac{5}{6} = \frac{10}{\square}$

(3)  $\frac{3}{4} = \frac{12}{\square}$

(4)  $\frac{7}{8} = \frac{\square}{24}$

4 Make five equivalent fractions of  $\frac{2}{5}$  freely.



Think about how to make equivalent fractions that are equivalent to  $\frac{6}{12}$ , like  $\frac{3}{6}$ ,  $\frac{2}{4}$ , and  $\frac{1}{2}$ .

$$\frac{6}{12} = \frac{3}{6} = \frac{2}{4} = \frac{1}{2}$$

Diagram showing the process of dividing numerator and denominator by the same number to create equivalent fractions:

- $\frac{6}{12} \xrightarrow{\div 2} \frac{3}{6}$
- $\frac{6}{12} \xrightarrow{\div 3} \frac{2}{4}$
- $\frac{6}{12} \xrightarrow{\div 6} \frac{1}{2}$

Equivalent fractions can also be obtained by dividing numerator and denominator of the fraction by the same number.

$$\frac{\text{red circle}}{\text{red square}} = \frac{\text{red circle} \div \text{green triangle}}{\text{red square} \div \text{green triangle}}$$

5 Find the missing numbers.

(1)  $\frac{3}{9} = \frac{\square}{3}$

(2)  $\frac{6}{8} = \frac{3}{\square}$

(3)  $\frac{4}{12} = \frac{1}{\square}$

(4)  $\frac{8}{20} = \frac{\square}{5}$

6 Make three equivalent fractions of  $\frac{12}{18}$  by dividing numerator and denominator of the fraction by the same number.



If fractions are equivalent, the simple fraction is easier

Dividing the numerator and denominator by the same number in order to make a fraction with a smaller denominator is called **reducing a fraction**.

To reduce a fraction, divide both the numerator and the denominator by a **common factor**.



Oh, 3 is the **common factor** of 15 and 18!

$$\frac{15}{18} = \frac{5}{6}$$

(Arrows show 15 divided by 3 to get 5, and 18 divided by 3 to get 6)

$$\frac{15}{18} = \frac{5}{6}$$

(The original fraction is crossed out, and the simplified fraction is shown)

We can do like this as a simple method.



Reduce  $\frac{16}{20}$ .

$$\frac{16}{20} = \frac{8}{10} = \frac{4}{5}$$

(Arrows show 16 divided by 2 to get 8, 20 divided by 2 to get 10, then 8 divided by 2 to get 4, and 10 divided by 2 to get 5)

$$\frac{16}{20} = \frac{4}{5}$$

(The original fraction is crossed out, and the simplified fraction is shown)

Dividing by 2 and then by 2 is the same as dividing by 4...

$$\frac{16}{20} = \frac{4}{5}$$

(The original fraction is crossed out, and the simplified fraction is shown)



And 4 is the **HCF** of 16 and 20.

While reducing fractions, we typically make the denominator as small as possible and get **the lowest term** of the fraction.

Dividing the denominator and the numerator by **the highest common factor (HCF)**, we can easily get **the lowest term**.



Reduce the following fractions to **the lowest term**.

- (1)  $\frac{4}{10}$  (2)  $\frac{12}{15}$  (3)  $\frac{9}{27}$  (4)  $\frac{24}{36}$  (5)  $\frac{28}{42}$  (6)  $\frac{40}{60}$

## 8.5 Exercise (1)

1. Find proper fractions and fractions equal to 1 in the box.

(1) proper fractions are:

$$\frac{2}{3}, \frac{4}{4}, \frac{5}{8}, \frac{8}{5}, \frac{3}{9}, \frac{13}{12}$$

(2) fractions equal to 1 are:

$$\frac{27}{26}, \frac{1}{1}, \frac{76}{76}, \frac{42}{48}, \frac{2}{25}, \frac{3}{3}$$

2. Arrange the following from smaller to larger and show it by symbols

(1)  $\frac{6}{7}, \frac{3}{7}, \frac{7}{7}, \frac{2}{7}$  (2)  $\frac{4}{7}, \frac{4}{5}, \frac{4}{11}, \frac{4}{9}$  (3)  $\frac{11}{23}, \frac{11}{13}, \frac{11}{17}, \frac{11}{91}$

3. Find the missing number.

(1)  $\frac{1}{3} = \frac{\square}{6}$  (2)  $\frac{3}{7} = \frac{\square}{28}$  (3)  $\frac{3}{4} = \frac{\square}{36}$  (4)  $\frac{4}{5} = \frac{12}{\square}$

(5)  $\frac{2}{9} = \frac{16}{\square}$  (6)  $\frac{5}{8} = \frac{30}{\square}$  (7)  $\frac{3}{6} = \frac{\square}{2}$  (8)  $\frac{12}{20} = \frac{\square}{5}$

(9)  $\frac{28}{36} = \frac{\square}{9}$  (10)  $\frac{33}{66} = \frac{1}{\square}$  (11)  $\frac{5}{65} = \frac{1}{\square}$  (12)  $\frac{12}{54} = \frac{2}{\square}$

4. Reduce the following fractions to the lowest term.

(1)  $\frac{6}{12}$  (2)  $\frac{3}{21}$  (3)  $\frac{9}{36}$  (4)  $\frac{16}{48}$  (5)  $\frac{8}{12}$  (6)  $\frac{9}{12}$

(7)  $\frac{20}{25}$  (8)  $\frac{32}{36}$  (9)  $\frac{18}{30}$  (10)  $\frac{16}{28}$  (11)  $\frac{28}{49}$  (12)  $\frac{24}{40}$



We have mastered how to make equivalent fractions.

Yes. And we can do a lot of things with this idea. Let's see it in the next sections.



## 8.6 Finding the common denominator



Let's study about fractions with different denominator.



You have  $\frac{2}{3}$  m long red ribbon and  $\frac{3}{4}$  m long blue one.

(1) Which one is longer ?

Why don't we convert these fractions into the ones with the **common denominator**?

Oh, yes. When the denominators are the same, then the fraction with a bigger numerator is larger.



$$\left. \begin{array}{l} \frac{2}{3} = \frac{4}{6} = \frac{6}{9} = \frac{8}{12} \\ \frac{3}{4} = \frac{6}{8} = \frac{9}{12} \end{array} \right\} \quad \begin{array}{l} \frac{8}{12} < \frac{9}{12} \\ \therefore \frac{2}{3} < \frac{3}{4} \end{array}$$



Answer: Blue ribbon is longer.

(2) What is the difference of length ?



When we find the difference, we subtract 'larger number - smaller number'.

But we cannot do  $\frac{3}{4} - \frac{2}{3}$ . How can we do?

Wait! Even though we cannot do directly  $\frac{3}{4} - \frac{2}{3}$ , we can do  $\frac{9}{12} - \frac{8}{12}$ .

$$\frac{3}{4} - \frac{2}{3} = \frac{9}{12} - \frac{8}{12} = \frac{1}{12}$$

Answer: The difference is  $\frac{1}{12}$  m





Wow, if we convert fractions into the fractions with **common denominator**, it will enable us not only to find larger or smaller of the fractions but also do subtraction and addition!

OK. Firstly let's study how to find a **common denominator** And then convert fractions into fractions with common denominator.



Convert  $\frac{3}{5}$  and  $\frac{2}{3}$  into fractions with common denominators.

$$\frac{3}{5} = \frac{6}{10} = \frac{9}{15} = \frac{12}{20}$$

$$\frac{2}{3} = \frac{4}{6} = \frac{6}{9} = \frac{8}{12} = \frac{10}{15}$$

5, 10, **15**, 20.

3, 6, 9, 12, **15**

Do you remember what these numbers are called?



Oh! Yes, 15 is the multiple of both 3 and 5. Moreover 15 is also the least common multiples (LCM) of 3 and 5!



To find a common denominator of the fractions at a time:

1. Find a common multiple of the denominators.
2. Convert the fractions so that they have the same denominator

We typically use the **least common multiples (LCM)** of the original denominators

$$\text{Answer: } \left[ \frac{3}{5}, \frac{2}{3} \right] \longrightarrow \left[ \frac{9}{15}, \frac{10}{15} \right]$$

## Fractions

1 Convert into fractions with common denominators.

$$(1) \left[ \frac{1}{3}, \frac{1}{4} \right] \longrightarrow [ \quad ]$$

$$(2) \left[ \frac{2}{3}, \frac{1}{2} \right] \longrightarrow [ \quad ]$$

$$(3) \left[ \frac{1}{2}, \frac{2}{5} \right] \longrightarrow [ \quad ]$$

$$(4) \left[ \frac{1}{3}, \frac{2}{5} \right] \longrightarrow [ \quad ]$$

$$(5) \left[ \frac{1}{2}, \frac{1}{4} \right] \longrightarrow [ \quad ]$$

$$(6) \left[ \frac{3}{4}, \frac{5}{6} \right] \longrightarrow [ \quad ]$$

$$(7) \left[ \frac{7}{9}, \frac{5}{12} \right] \longrightarrow [ \quad ]$$

$$(8) \left[ \frac{1}{3}, \frac{1}{4}, \frac{1}{2} \right] \longrightarrow [ \quad ]$$

$$(9) \left[ \frac{1}{2}, \frac{2}{3}, \frac{1}{5} \right] \longrightarrow [ \quad ]$$

$$(10) \left[ \frac{3}{5}, \frac{3}{4}, \frac{7}{10} \right] \longrightarrow [ \quad ]$$

2 Convert into the fractions with common denominators and compare with the symbols '<', '>' or '='.

$$(1) \frac{7}{9} \square \frac{5}{12} \quad (2) \frac{3}{4} \square \frac{5}{7} \quad (3) \frac{2}{3} \square \frac{6}{9} \quad (4) \frac{11}{16} \square \frac{17}{24}$$

Now, we have mastered how to convert fractions into the fractions with common denominator



OK, let's apply this idea to addition and subtraction of fractions with different denominators.



## 8.7 Addition and Subtraction of Fractions

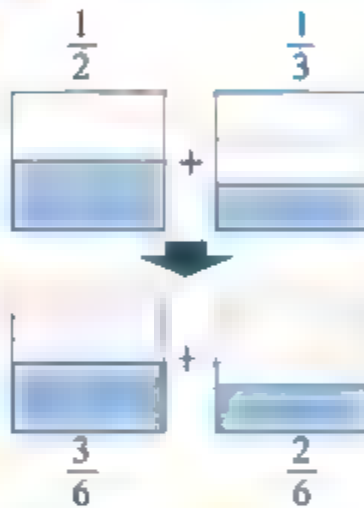


The bottle A has  $\frac{1}{2}$  litre of water and B has  $\frac{1}{3}$  litre of water

How many litres of water are in two bottles?



We are calculating the total amount. So, the operation must be   .



Mathematical sentence:  $\frac{1}{2} + \frac{1}{3}$

Calculation.

$$\frac{1}{2} + \frac{1}{3} = \frac{3}{6} + \frac{2}{6}$$

$$= \boxed{\phantom{00}}$$

Answer:  $\frac{5}{6}$  litre.

To add fractions with different denominators, firstly convert fractions into fractions with common denominator and then calculate.

1 Add using fractions with common denominators:

$$(1) \frac{1}{4} + \frac{1}{3} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} + \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}}$$

$$(2) \frac{1}{4} + \frac{2}{5} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} + \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}}$$

$$(3) \frac{1}{6} + \frac{2}{9} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} + \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}}$$

$$(4) \frac{1}{8} + \frac{5}{6}$$

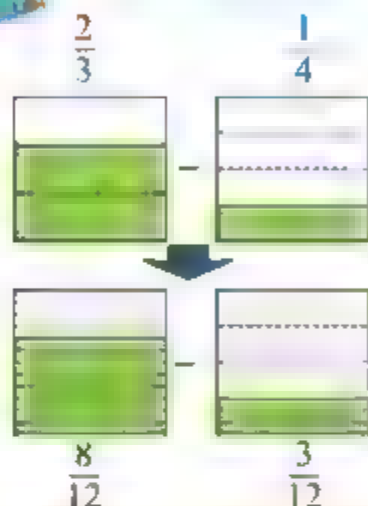
## Fractions



You have  $\frac{2}{3}$  litre of milk and you've drunk  $\frac{1}{4}$  litre. How many litres are left?



It's a problem about a remainder. So, the operation is .



Mathematical sentence:  $\frac{2}{3} - \frac{1}{4}$

Calculation:

$$\frac{2}{3} - \frac{1}{4} = \frac{8}{12} - \frac{3}{12}$$

$$= \boxed{\phantom{00}}$$

Answer  $\frac{5}{12}$  litre

To subtract fractions with different denominators, first we convert fractions into the fractions with common denominator and then calculate.

1 ? Subtract using fractions with common denominators

(1)  $\frac{1}{2} - \frac{1}{3} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} - \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}}$

(2)  $\frac{1}{4} - \frac{1}{5} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} - \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}}$

(3)  $\frac{2}{3} - \frac{2}{5} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} - \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}}$

(4)  $\frac{3}{8} - \frac{1}{4} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} - \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}}$

(5)  $\frac{5}{6} - \frac{3}{8}$

(6)  $\frac{7}{10} - \frac{4}{15}$



Do calculation.

(1)  $\frac{1}{3} + \frac{1}{6}$

$$\frac{1}{3} + \frac{1}{6} = \frac{2}{6} + \frac{1}{6} = \frac{\cancel{3}}{\cancel{6}_2} = \frac{1}{2}$$

(2)  $\frac{1}{2} - \frac{1}{6}$

$$\frac{1}{2} - \frac{1}{6} = \frac{3}{6} - \frac{1}{6} = \frac{\cancel{2}}{\cancel{6}_3} = \frac{1}{3}$$

If possible, reduce the fraction to its **lowest term**.

## 2 ? Do addition and subtraction

We must be careful not to forget reducing.



(1)  $\frac{1}{4} + \frac{3}{20}$  (2)  $\frac{1}{4} + \frac{7}{12}$  (3)  $\frac{3}{8} + \frac{1}{24}$  (4)  $\frac{4}{15} + \frac{1}{12}$  (5)  $\frac{8}{15} + \frac{3}{10}$

(6)  $\frac{11}{14} - \frac{2}{7}$  (7)  $\frac{1}{2} - \frac{1}{6}$  (8)  $\frac{5}{6} - \frac{7}{18}$  (9)  $\frac{11}{12} - \frac{4}{15}$  (10)  $\frac{13}{15} - \frac{9}{20}$



Do calculations with three fractions.

(1)  $\frac{1}{6} + \frac{1}{3} + \frac{1}{4}$

$$\frac{1}{6} + \frac{1}{3} + \frac{1}{4} = \frac{2}{12} + \frac{4}{12} + \frac{3}{12} = \frac{\cancel{9}}{\cancel{12}_4} = \frac{3}{4}$$

(2)  $1 - \frac{1}{2} - \frac{1}{4}$

$$1 - \frac{1}{2} - \frac{1}{4} = \frac{4}{4} - \frac{2}{4} - \frac{1}{4} = \frac{1}{4}$$

## 8.8 Exercise (2)

1 Convert into fractions with common denominators and compare with the symbols '<', '>' or '='.

(1)  $\frac{1}{3} \square \frac{1}{5}$  (2)  $\frac{3}{4} \square \frac{5}{6}$  (3)  $\frac{5}{7} \square \frac{6}{9}$  (4)  $\frac{3}{4} \square \frac{12}{16}$  (5)  $\frac{3}{24} \square \frac{7}{72}$

2. Add :

(1)  $\frac{1}{4} + \frac{1}{2}$  (2)  $\frac{2}{5} + \frac{3}{7}$  (3)  $\frac{1}{6} + \frac{3}{8}$  (4)  $\frac{3}{7} + \frac{1}{3}$  (5)  $\frac{2}{9} + \frac{5}{12}$

Do these carefully

(6)  $\frac{5}{6} + \frac{1}{10}$  (7)  $\frac{2}{3} + \frac{2}{15}$  (8)  $\frac{1}{6} + \frac{2}{15}$  (9)  $\frac{4}{15} + \frac{2}{5}$  (10)  $\frac{1}{6} + \frac{7}{12}$



Every time after the calculation, we need to check whether reducing the fractions to the lowest terms is needed or not.

3. Subtract .

(1)  $\frac{1}{3} - \frac{1}{4}$  (2)  $\frac{5}{6} - \frac{2}{5}$  (3)  $\frac{1}{3} - \frac{1}{6}$  (4)  $\frac{4}{9} - \frac{1}{6}$  (5)  $\frac{11}{12} - \frac{7}{9}$

Do these carefully

(6)  $\frac{9}{10} - \frac{2}{5}$  (7)  $\frac{7}{12} - \frac{1}{4}$  (8)  $\frac{4}{15} - \frac{1}{6}$  (9)  $\frac{2}{3} - \frac{7}{15}$  (10)  $\frac{9}{10} - \frac{5}{6}$

4. Calculate :

(1)  $\frac{1}{3} + \frac{1}{4} + \frac{1}{12}$  (2)  $\frac{1}{6} + \frac{1}{3} + \frac{2}{9}$  (3)  $\frac{1}{2} - \frac{1}{3} - \frac{1}{9}$  (4)  $\frac{3}{4} - \frac{3}{5} + \frac{1}{2}$

5. Fill in the blank boxes:

$$(1) \frac{\square}{3} + \frac{1}{5} = \frac{13}{15}$$

$$(2) \frac{5}{7} + \frac{\square}{5} = \frac{32}{35}$$

$$(3) \frac{5}{6} - \frac{\square}{7} = \frac{23}{42}$$

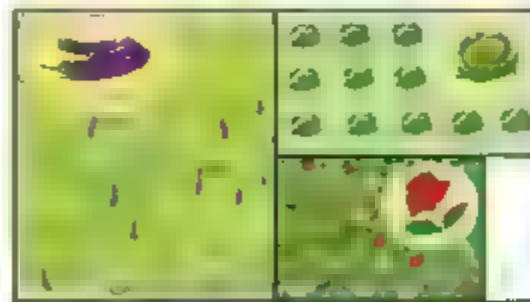
6 Sabuj's house is  $\frac{3}{8}$  km to the west of the school. Mitu's house is  $\frac{5}{12}$  km to the east of her house.



(1) How far is Mitu's house from Sabuj's house?

(2) Whose house is nearer to school? What is the difference of the distance from Sabuj's house and Mitu's house to the school?

7. A farmer planted brinjal in  $\frac{1}{2}$  part, cabbage in  $\frac{1}{4}$  part and flowers in  $\frac{1}{5}$  part of his garden.



(1) How much part of the garden did he plant?

(2) How much part of the garden remained empty?

## Chapter Nine Decimals

### 9.1 Decimals



Let's learn another method to represent the fraction amount



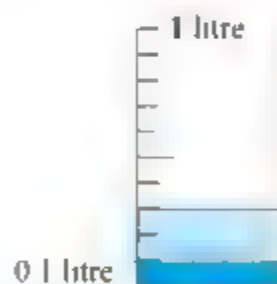
There is some water in a jug. The water is poured into three mugs of one litre each. The third mug is not full as the picture shows. How much water is there in the third mug?



When we represent the fractional amount, we often use  $\frac{1}{10}$  of the original unit

The volume of  $\frac{1}{10}$  of 1 litre is '0.1 litre', and in words it is written and read as 'zero point one litre'.

$$0.1 \text{ litre} = \frac{1}{10} \text{ litre}$$



The third mug contains  $\frac{3}{10}$  litre.

$\frac{3}{10}$  litre is **three times of 0.1 litre**. So, it's **0.3 litre**.

In the jug, there was **2 litres and 0.3 litre** of water which can be represented by **2.3 litres** and read as **two point three litres** in words.



Numbers such as 0.1, 0.3, 2.3 and so on are called **decimals** and “.” is called a **decimal point**.

Name of the place	one	tenths
	2	3
How to read	two	point three

The place to the right of the decimal point is called:

the **tenths place** ( $\frac{1}{10}$  s place).

In contrast, numbers which we have studied such as 0, 1, 2, and so on, without fraction part, are called **integers**.



- 1 Represent the following volumes using decimals and write in words.

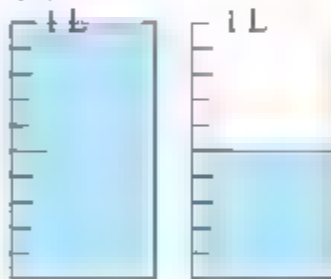
(1)



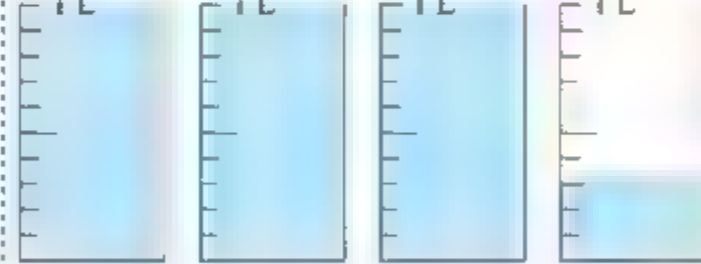
(2)



(3)



(4)



Remember that 'L' is short for 'litre.'



- 2 Classify these numbers in decimals and integers

0.6 1.7 2  
4 11.3 36.8

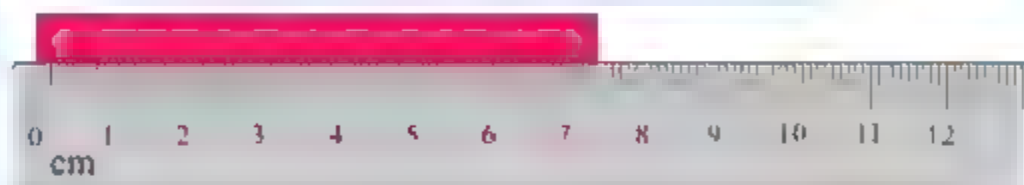
Decimals	
Integers	

## Decimals



How many centimetres is the length of the red tape?

Remember that 'cm' is short for 'centimetre' and 'mm' is short for 'millimetre.'



(1) What is the length of the tape?

cm mm

(2) How many cm is 1 mm?

cm

1 mm is  $\frac{1}{10}$  cm so...

(3) How can you write 4 mm in cm?

cm

(4) How can you write 7 cm 4 mm in cm?

cm



The weight of the oranges in the picture is 1 kilogram and 500 gram. What is the weight of the oranges?



'kg' is short for 'kilogram' and 'g' is short for 'gram.'

(1) How can you write 100g in kg?

kg

Remember that 1000 gram is equivalent to 1 kilogram.

(2) How can you write 500g in kg?

kg

(3) How can you write 1kg and 500g in kg?

kg

We use decimals in many situations in our daily life. Let's learn more about decimals.



## 9.2 Size of decimals



Let's compare the size of decimals.



1. What numbers are represented for A, B, C and D on the number line?



2. Put these numbers on the number line above

0.9, 0.5, 2.6, and 3.2

3. How many 0.1s consist of 0.5, 1.8 and 3.3?



4. Answer the following questions.

- Write the number made of twenty five 0.1s.
- Write the number made of twenty 0.1s.
- How many 0.1s make 3.2?
- How many 1s and 0.1s make 3.2?

"20" can be expressed as "2."

5. Which is larger, 2.1 or 1.3?



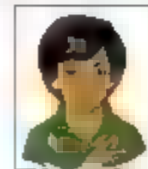
Rita

I put these numbers on the number line to compare their size. The number on the right is larger



2.1 is made of twenty one 0.1s.

1.3 is made of thirteen 0.1s. So,  $2.1 > 1.3$



Jogen

1. Which is larger? Write ' $<$ ' or ' $>$ '

- (1) 2.4  1.8 (2) 3  0.8 (3) 7.1  6.8 (4) 0  0.1

## Decimals



Which is larger,  $\frac{2}{10}$  or 0.3?

Oh... how can we compare fractions and decimals?



I think about the number made of 0.1s.



I think about the number made of  $\frac{1}{10}$  s.

$\frac{2}{10}$  is made of two 0.1s.

0.3 is made of three 0.1s.

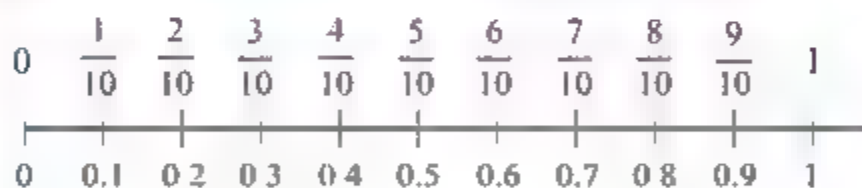
$$\therefore \frac{2}{10} < 0.3$$

$\frac{2}{10}$  is made of two  $\frac{1}{10}$  s.

0.3 is made of three  $\frac{1}{10}$  s.

$$\therefore \frac{2}{10} < 0.3$$

Let's clarify the relation between common fractions and decimals on the number line.



Which is larger? Represent with Relation Symbols (<, > or =).

(1)  $\frac{8}{10}$   0.7    (2) 0.3   $\frac{3}{10}$     (3) 0.1   $\frac{3}{10}$     (4)  $\frac{10}{10}$   0.9

### 9.3 Addition and Subtraction of Decimals (1)



Let's try addition and subtraction of decimals



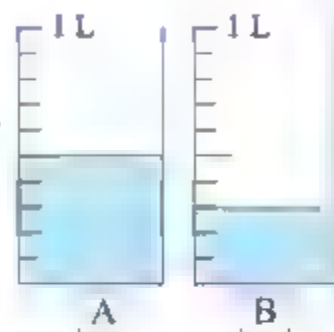
Container A has 0.5 litre of water and container B has 0.3 litre of water.

(1) How many litres of water are there in two bottles?



To find total amount, we choose

Mathematical sentence is \_\_\_\_\_



Let's think about how many 0.1s are there in the numbers.



Calculation is...

0.5 is made of five 0.1s and 0.3 is made of three 0.1s.  
In all, there are  $(5 + 3)$  0.1s  $\therefore$  The answer is 0.8 litre

(2) How much more water is there in A than B?

To find difference in the amount of water, we choose



Mathematical sentence is: \_\_\_\_\_

Calculation is...

$(\text{five } 0.1\text{s}) - (\text{three } 0.1\text{s})$  So difference is  $(5 - 3)$  0.1s  
 $\therefore$  The answer is: 0.2 litre



Do addition and subtraction

- |                 |                 |                 |                 |
|-----------------|-----------------|-----------------|-----------------|
| (1) $0.3 + 0.4$ | (2) $0.7 + 0.2$ | (3) $0.5 + 0.5$ | (4) $0.9 + 0.3$ |
| (5) $0.8 - 0.6$ | (6) $0.7 - 0.2$ | (7) $1 - 0.3$   | (8) $1.6 - 0.4$ |

## Decimals

As we see, if we think about how many 0 1s are there in the numbers, we can calculate in almost the same way as of integers.



So we can do vertical calculation!

$$\begin{array}{r} 1.9 \\ + 2.3 \\ \hline 4.2 \end{array}$$

$$\begin{array}{r} 2.4 \\ - 0.6 \\ \hline 1.8 \end{array}$$

Yes, and it's important to line up the places properly.



### The rules of the vertical calculation

1. Line up the places vertically.
2. Calculate in the same way as addition and subtraction of integers
3. Place a decimal point in the answer, lining it up with the decimal points above

And we must be careful about some more points.



Do addition and subtraction.

(1)  $1.3 + 2.7$

$$\begin{array}{r} \checkmark \quad 1.3 \\ + \quad 2.7 \\ \hline 4.0 \end{array}$$

$$1.3 + 2.7 = 4.0$$

But we write it just as 4.

$$\checkmark 1.3 + 2.7 = 4$$

(2)  $7 + 5.5$

$$\begin{array}{r} \times \quad 7 \\ + \quad 5.5 \\ \hline 6.2 \end{array}$$

$$\begin{array}{r} \checkmark \quad 7.0 \\ + \quad 5.5 \\ \hline 12.5 \end{array}$$

Think about  
7 as 7.0

(3)  $5 - 0.3$

$$\begin{array}{r} \times \quad 5 \\ - \quad 0.3 \\ \hline 0.2 \end{array}$$

$$\begin{array}{r} \checkmark \quad 5.0 \\ - \quad 0.3 \\ \hline 4.7 \end{array}$$

Think about  
5 as 5.0.

(4)  $3.6 - 2.8$

$$\begin{array}{r} 3.6 \\ - 2.8 \\ \hline \times \quad 0.8 \end{array}$$

$$\begin{array}{r} 3.6 \\ - 2.8 \\ \hline \checkmark \quad 0.8 \end{array}$$

Don't forget to  
put '.' and '0'  
in ones place.



## 9.4 Exercise (1)

1 Which one is larger? Express them with Relation Symbols ( $<$ ,  $>$  or  $=$ )

(1)  $0.4 \square 0.7$  (2)  $5.6 \square 6.5$  (3)  $0.1 \square 0$  (4)  $11 \square 1.1$

(5)  $\frac{5}{10} \square 0.5$  (6)  $0.7 \square \frac{3}{10}$  (7)  $0.1 \square \frac{1}{10}$  (8)  $\frac{10}{10} \square 1$

2. Addition and Subtraction.

(1)  $0.6 + 0.4$  (2)  $0.8 + 0.5$  (3)  $0.6 + 0.7$  (4)  $1.8 + 0.2$

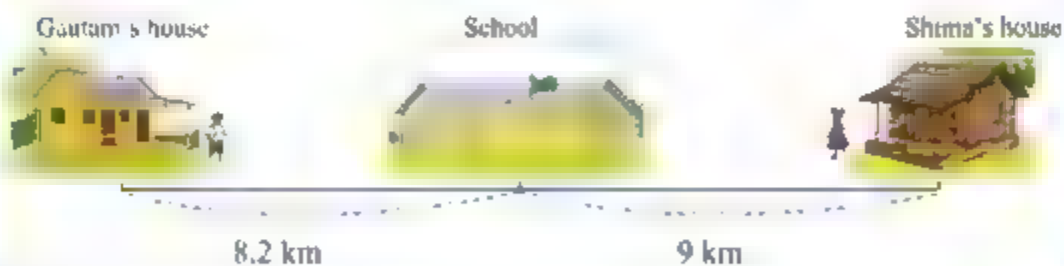
(5)  $0.7 - 0.4$  (6)  $1 - 0.2$  (7)  $1.2 - 0.3$  (8)  $2 - 0.4$

3. Do vertical calculation.

(1) 
$$\begin{array}{r} 1.2 \\ + 3.6 \\ \hline \end{array}$$
 (2) 
$$\begin{array}{r} 2.8 \\ + 1.5 \\ \hline \end{array}$$
 (3) 
$$\begin{array}{r} 4.7 \\ + 3.9 \\ \hline \end{array}$$
 (4) 
$$\begin{array}{r} 3 \\ + 6.8 \\ \hline \end{array}$$
 (5) 
$$\begin{array}{r} 4.1 \\ + 3.9 \\ \hline \end{array}$$

(6) 
$$\begin{array}{r} 3.4 \\ - 1.3 \\ \hline \end{array}$$
 (7) 
$$\begin{array}{r} 5 \\ - 2.8 \\ \hline \end{array}$$
 (8) 
$$\begin{array}{r} 7.6 \\ - 1.6 \\ \hline \end{array}$$
 (9) 
$$\begin{array}{r} 6.3 \\ - 5.5 \\ \hline \end{array}$$
 (10) 
$$\begin{array}{r} 9.1 \\ - 8.9 \\ \hline \end{array}$$

4. Gautam's house is 8.2 km to the west of the school. Shima's house is 9 km to the east of her house.



(1) How far is Shima's house from Gautam's house?

(2) How many kilometres are the distance from school to Shima's house than the distance from school to Gautam's house?

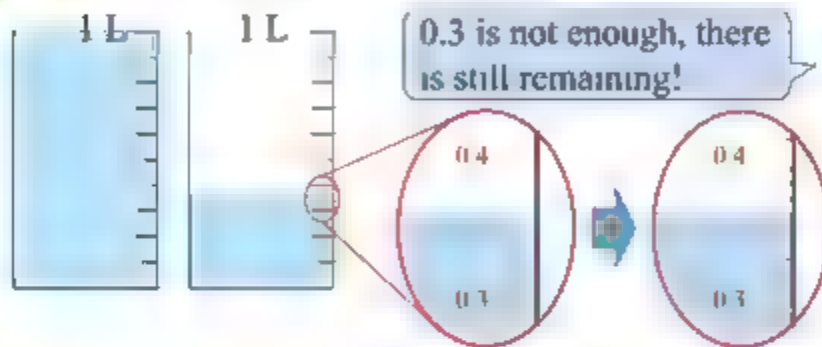
## 9.5 Hundredths and Thousandths place



Let's study how to represent the smaller decimal



How can we represent the following amount of water?



$\frac{1}{10}$  of 1 litre — 0.1 litre

$\frac{1}{10}$  of 0.1 litre — 0.01 litre (zero point zero one litre)

We need to divide 0.1 litre into 10 equal parts.



And 0.01 litre is  $\frac{1}{100}$  of 1 litre.



Total amount is:

one 1 litre — . litre

three 0.1s litre — . litre

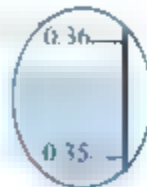
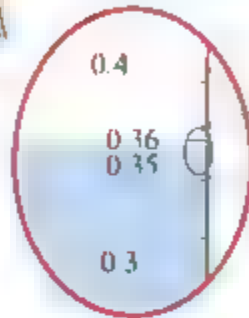
six 0.01s litre — . litre

**1.36 litre**

(one point three six litre)



Then what if there is much smaller amount? For example...



Then we need to divide 0.01 litre into 10 equal parts.



$\frac{1}{10}$  of 0.01 litre = 0.001 litre (zero point zero zero one litre)



And 0.001 litre is  $\frac{1}{1000}$  of 1 litre.

In this case, there are **eight 0.001** litre. So  
Total amount is: 1.358 litre

Name of the place	one	tenth ( $\frac{1}{10}$ s)	hundredths ( $\frac{1}{100}$ s)	thousandths ( $\frac{1}{1000}$ s)
	1	3	5	8
How to read	one	point three	five	eight

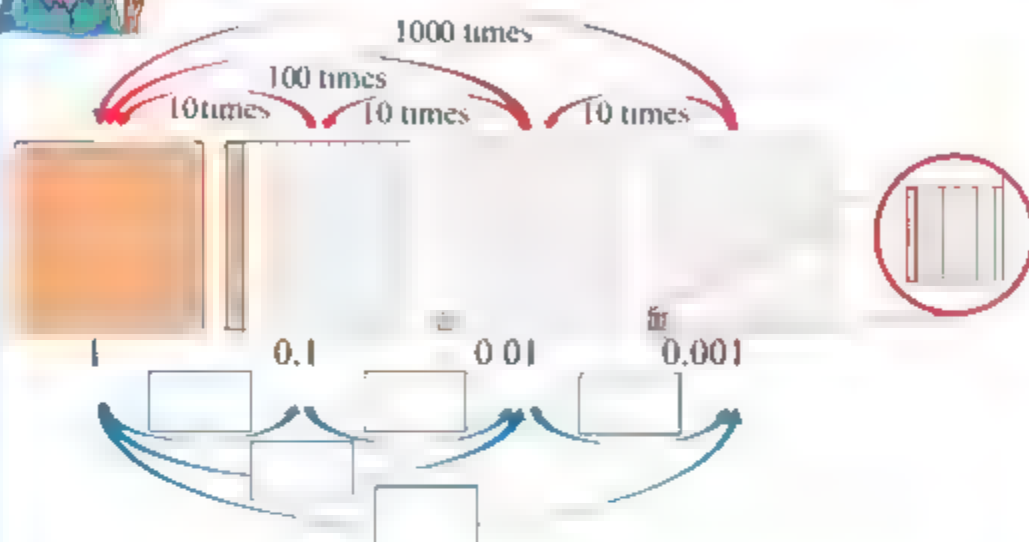
The place to the right of the **tenths place** is called the **hundredths place** ( $\frac{1}{100}$ s place).

The place to the right of the **hundredths place** is called the **thousandths place** ( $\frac{1}{1000}$ s place).

# Decimals



Let's see the relation among 1, 0.1, 0.01, and 0.001.



Each numeral in the decimal has a fixed place and is 10 times of the right or  $\frac{1}{10}$  of the left



How many 1s, 0.1s, 0.01s, and 0.001s are combined in the following numbers?

- (1) 1.469      (2) 3.825      (3) 0.017

1.469 combines

one 1s

four 0.1s

0.01s

0.001s

3.825 combines

1s

0.1s

0.01s

0.001s

0.017 combines

1s

0.1s

0.01s

0.001s



1. How many 0.01s are combined to make these numbers?

(1) 0.23 (2) 4.23 (3) 8.07 (4) 11.46 (5) 11.4

Let's think about how many 0.01s are there in the numbers.



Three 0.01s is 0.03...

Twenty-three 0.01s is 0.23...

Four hundred and twenty-three 0.01s is 4.23...



2. How many 0.001s are combined to make these numbers?

(1) 0.015 (2) 0.478 (3) 2.075 (4) 4.23

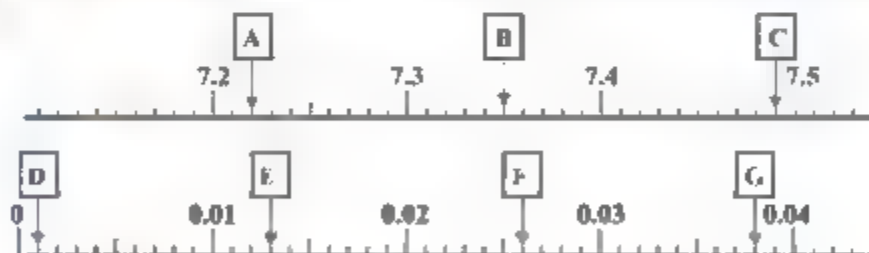
Be careful



Answer the questions.

- Write the number made of one hundred and fifty five 0.01s
- Write the number made of one hundred and fifty five 0.001s.
- How many 0.01s make 6.82?
- How many 0.001s make 6.82?

2. 1. What numbers are represented for A to G on the number line?



2. Represent these numbers on the number line.

0.001, 0.015, 0.027, 0.034



## Decimals



Multiply 0.56 by 10 and 100. And also divide it by 10.

0.56 is made by combining fifty six 0.01s. So



10 times 0.56 equals to:

56 of 10 times 0.01

➡ 56 of 0.1

➡ 5.6

100 times 0.56 equals to:

56 of 100 times 0.01

➡ 56 of 1

➡ 56

0.56 divided by 10 equals to:

56 of 0.01 divided by 10

➡ 56 of 0.001

➡ 0.056

tens	ones	tenths ( $\frac{1}{10}$ )	hundredths ( $\frac{1}{100}$ )	thousandths ( $\frac{1}{1000}$ )	
5	6				10 times
	5	6			100 times
	0	5	6		10 times
	0	0	5	6	$\frac{1}{10}$

Each place in a decimal number increases by one place when you multiply by 10 and decreases by one place when you divide by 10.

3

Multiply the following numbers by 10. And also divide them by 10.

(1) 0.6

(2) 0.49

(3) 1.11

(4) 7.32



## 9.6 Addition and Subtraction of Decimals (2)



Let's try calculation with hundredths and thousandths place



Samson traveled 5.52 kilometres by bus and 2.65 kilometres by boat. How much path did he travel in total?



To find total amount, the operation is \_\_\_\_\_.



Mathematical sentence \_\_\_\_\_

Calculation is...

$$\begin{array}{r} 5.52 \\ + 2.65 \\ \hline 8.17 \end{array}$$

Answer 8.17 kilometers

Let's think about how many 0.01s are there in the numbers.

We can calculate in almost the same way as of integers.



Hasan's bag weighs 4.8 kilogram and Ripa's weighs 3.59 kilogram. What is the difference of weight between their bags in kilogram?



When we calculate difference we use \_\_\_\_\_.



Mathematical sentence: \_\_\_\_\_

Calculation

$$\begin{array}{r} 4.80 \\ - 3.59 \\ \hline 1.21 \end{array}$$

Answer The difference is 1.21 kilograms

Line up the places. And Think about 4.8 as 4.80.



# Decimals



Do addition and subtraction carefully

(1)  $4.06 + 2.94$

$$\begin{array}{r} \checkmark 4.06 \\ + 2.94 \\ \hline 7.00 \end{array}$$

$4.06 + 2.94 = 7.00$   
But we write it just as 7.  
 $\checkmark 4.06 + 2.94 = 7$

(2)  $6 + 4.85$

$$\begin{array}{r} \times \quad 6 \\ + 4.85 \\ \hline 4.91 \end{array}$$

$$\begin{array}{r} \checkmark 6.00 \\ + 4.85 \\ \hline 10.85 \end{array}$$

Think about 6 as 6.00.

(3)  $4 - 2.31$

$$\begin{array}{r} \times \quad 4 \\ - 2.31 \\ \hline 2.33 \end{array}$$

$$\begin{array}{r} \checkmark 4.00 \\ - 2.31 \\ \hline 1.69 \end{array}$$

Think about 4 as 4.00.

(4)  $3.75 - 0.5$

$$\begin{array}{r} 3.75 \\ - 0.5 \\ \hline \times 3.70 \end{array}$$

$$\begin{array}{r} 3.75 \\ - 0.50 \\ \hline \checkmark 3.25 \end{array}$$

Think about 0.5 as 0.50.

(5)  $7.58 - 6.87$

$$\begin{array}{r} 7.58 \\ - 6.87 \\ \hline \times \quad 71 \end{array}$$

$$\begin{array}{r} 7.58 \\ - 6.87 \\ \hline \checkmark 0.71 \end{array}$$

Don't forget to put "." and "0" in ones place.



Do vertical calculations.

(1)  $\begin{array}{r} 3.27 \\ + 2.51 \\ \hline \end{array}$

(2)  $\begin{array}{r} 0.28 \\ + 6.72 \\ \hline \end{array}$

(3)  $\begin{array}{r} 4.07 \\ + 3.6 \\ \hline \end{array}$

(4)  $\begin{array}{r} 3.141 \\ + 5.379 \\ \hline \end{array}$

(5)  $\begin{array}{r} 5.47 \\ - 3.25 \\ \hline \end{array}$

(6)  $\begin{array}{r} 8.26 \\ - 3.4 \\ \hline \end{array}$

(7)  $\begin{array}{r} 4. \\ - 2.25 \\ \hline \end{array}$

(8)  $\begin{array}{r} 7.652 \\ - 6.648 \\ \hline \end{array}$

## 9.7 Decimal and Fraction



Let's try to convert decimals into fractions and vice-versa.



Express 0.3, 0.15, and 0.008 as fractions.

$$0.3 = \frac{\boxed{\phantom{00}}}{10}$$

$$0.15 = \frac{\boxed{\phantom{00}}}{100}$$

$$0.008 = \frac{\boxed{\phantom{00}}}{1000}$$

We have studied,

$$0.1 = \frac{1}{10}$$

$$0.01 = \frac{1}{100}$$

$$0.001 = \frac{1}{1000}$$



We can express decimals as fractions by using 10, 100, 1000 and so on in the denominator.

Then if possible, reduce the answer to get the lowest term.

$$0.15 = \frac{\overset{3}{\cancel{15}}}{\underset{20}{\cancel{100}}} = \frac{3}{20} \quad 0.008 = \frac{\overset{1}{\cancel{8}}}{\underset{125}{\cancel{1000}}} = \frac{1}{125}$$



Convert the decimals into fractions. And if possible, reduce the answer to get the lowest term.

(1) 0.55

(2) 0.04

(3) 0.75

(4) 0.25



Then I think we can also express fractions as decimals in the same way, by using 10, 100, 1000 and so on in the denominator.

## Decimals



1. Express  $\frac{3}{10}$ ,  $\frac{27}{100}$ ,  $\frac{341}{1000}$  as decimals.

$$\frac{3}{10} = 0.3 \quad \frac{27}{100} = 0.27 \quad \frac{341}{1000} = 0.341$$

2. Express  $\frac{3}{20}$ ,  $\frac{7}{25}$ ,  $\frac{17}{50}$  as decimals.

How about making equivalent fraction with 10, 100, 1000 and so on in a denominator?

$$\frac{3}{20} \xrightarrow{\times 5} \frac{15}{100}$$



$$\frac{3}{20} = \frac{3 \times 5}{20 \times 5} = \frac{15}{100} = 0.15$$

$$\frac{7}{25} = \frac{7 \times 4}{25 \times 4} = \frac{28}{100} = 0.28$$

$$\frac{17}{50} = \frac{17 \times 2}{50 \times 2} = \frac{34}{100} = 0.34$$



Can we convert  $\frac{1}{3}$  into decimals?

I think it's difficult. But at the secondary level, we may solve it.



We can express fractions as decimals by using 10, 100, 1000 and so on in the denominator, but not for all the fractions.

2 ? Convert the fractions into decimals.

(1)  $\frac{7}{20}$     (2)  $\frac{11}{25}$     (3)  $\frac{37}{50}$     (4)  $\frac{1}{4}$

## 9.8 Exercise (2)

1. Represent these numbers on the number line.

0.881, 0.889, 0.895, 0.899, 0.901



2. How many 0.001s are combined to make these numbers?

(1) 0.031    (2) 0.296    (3) 1.047    (4) 1.03

3. Multiply the following numbers by 10. And also divide them by 10.

(1) 0.6    (2) 0.49    (3) 1.11    (4) 7.32

4. Do vertical calculation.

(1)	(2)	(3)	(4)	(5)
$\begin{array}{r} 3.57 \\ + 1.24 \\ \hline \end{array}$	$\begin{array}{r} 4.38 \\ + 3.7 \\ \hline \end{array}$	$\begin{array}{r} 6.25 \\ + 1.55 \\ \hline \end{array}$	$\begin{array}{r} 0.82 \\ + 2.39 \\ \hline \end{array}$	$\begin{array}{r} 3.079 \\ + 0.921 \\ \hline \end{array}$

(6)	(7)	(8)	(9)	(10)
$\begin{array}{r} 5.38 \\ - 2.19 \\ \hline \end{array}$	$\begin{array}{r} 8.65 \\ - 0.7 \\ \hline \end{array}$	$\begin{array}{r} 7.2 \\ - 5.37 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ - 0.42 \\ \hline \end{array}$	$\begin{array}{r} 1.467 \\ - 0.397 \\ \hline \end{array}$

5. Convert the fractions into decimals and decimals into fractions. If possible, reduce the fraction to get the lowest term.

(1)  $\frac{3}{25}$     (2)  $\frac{17}{50}$     (3)  $\frac{3}{4}$     (4) 0.6    (5) 0.25    (6) 0.075

6. Yesterday's highest temperature was  $32.55^{\circ}$  Celsius and today's is  $28.87^{\circ}$ . Find the difference?

7. You have the following four cards. Now make decimals using the format on the right.

$\boxed{1}$      $\boxed{3}$      $\boxed{5}$      $\boxed{0}$

- (1) What is the largest number you can make?  
(2) What is the smallest number you can make?

A rectangular box representing a decimal number. It contains a decimal point followed by four empty square boxes for digits:  $\square.\square\square\square\square$ .

## Chapter Ten

# Measurement

### 10.1 Length and Perimeter



Let's convert the unit of lengths: km, m, cm, and mm.

Let's review relation among the unit of length.



km (kilometre)	m (metre)	cm (centimetre)	mm (millimetre)
1 km	= 1000 m		
	1 m	= 100 cm	
		1 cm	= 10 mm
			1 mm



The height of Monindra Tripura is 1 m 42 cm

(1) Express in 'cm.'

$$1 \text{ m} = 100 \text{ cm}$$

$$\therefore 1 \text{ m } 42 \text{ cm} = \underline{142 \text{ cm}}$$

(2) Express in 'm.'

$$10 \text{ cm} = 0.1 \text{ m}$$

$$\longrightarrow 40 \text{ cm} = 0.4 \text{ m}$$

$$1 \text{ cm} = 0.01 \text{ m}$$

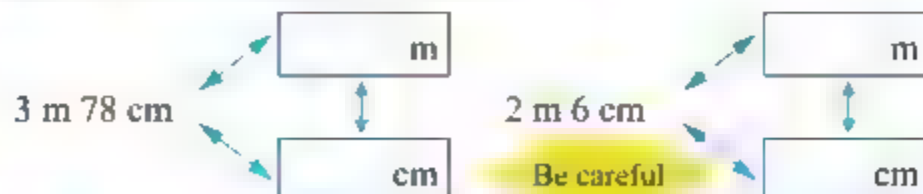
$$\longrightarrow 2 \text{ cm} = 0.02 \text{ m}$$

$$\therefore 1 \text{ m } 42 \text{ cm} = \underline{1.42 \text{ m}}$$



1

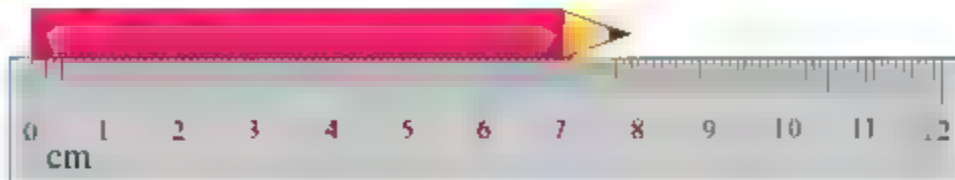
Express these lengths in 'm' and 'cm.'







Express the length of the pencil in 'cm' and 'mm'.



The length of the pencil: 7.9 cm / 79 mm

2 Express these lengths in "cm," "mm," and in both

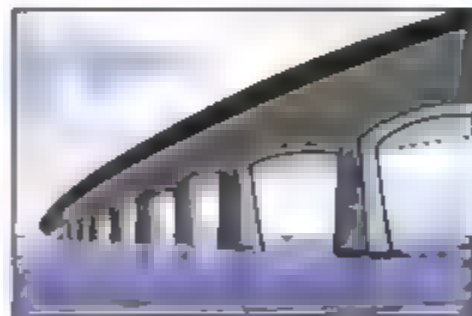


3 Measure different objects from your surrounding environment (e.g. book, stick, table, brick, etc.) and express in "m," "cm," and "mm."

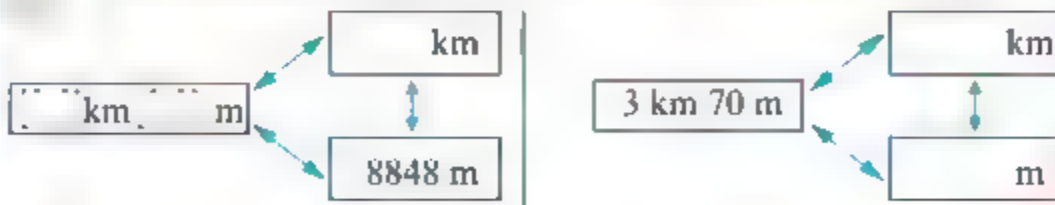


Express 3796 metres in "km."

$$\begin{aligned}
 3000 \text{ m} &= \boxed{\phantom{00}} \text{ km} \\
 700 \text{ m} &= 0.7 \text{ km} \\
 90 \text{ m} &= \boxed{\phantom{00}} \text{ km} \\
 6 \text{ m} &= 0.006 \text{ km} \\
 \therefore 3796 \text{ m} &= \underline{\underline{3.796 \text{ km}}}
 \end{aligned}$$



4 Express these lengths in 'km,' 'm,' and in both.



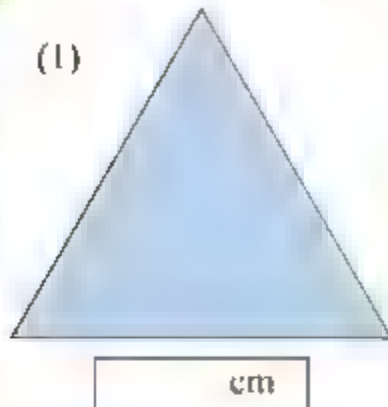
5 For a marathon, a runner runs 42 195 km. Express 42 195 km in 'm.'

## Measurement

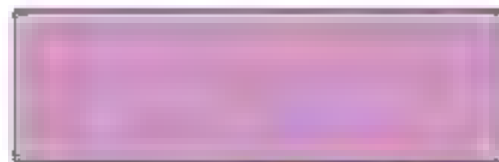


Measure the total length of the sides of each shape using cm scale.

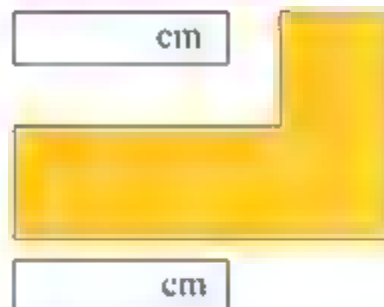
(1)



(2)



(3)

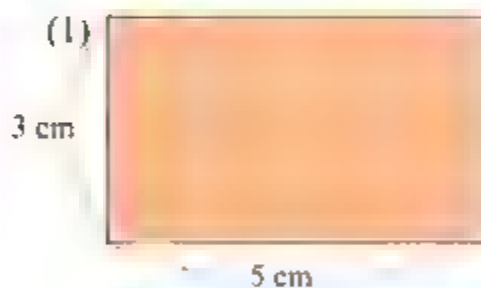


The total distance around the sides of the figure is called **perimeter**.



Find the perimeter of the following rectangular and square.

(1)



(2)



I remember that the opposite sides of a rectangle have the same length.

And four sides of a square have the same length.

$$(3 + 5) \times 2 = \boxed{\phantom{00}} \\ \boxed{\phantom{00}} \text{ cm}$$

$$4 \times 4 = \boxed{\phantom{00}} \\ \boxed{\phantom{00}} \text{ cm}$$

6

Measure and calculate perimeter of the shapes around you

## 10.2 Weight



Let's convert the unit of weight kg and g.

kg (kilogram)	g (gram)
1 kg	= 1000 g



The back pack weighs 8245g. Let's convert the unit of weight from g into kg.

$$8000 \text{ g} = 8 \text{ kg}$$

$$200 \text{ g} = \boxed{\phantom{00}} \text{ kg}$$

$$40 \text{ g} = 0.04 \text{ kg}$$

$$5 \text{ g} = \boxed{\phantom{00}} \text{ kg}$$

$$\therefore 8245 \text{ g} = \underline{\underline{8.245 \text{ kg}}}$$



You weigh something with a set of standard weights.



How heavy are they? Express in "kg" and "g"

(1)



500 g, 200 g,  
50 g, 10 g

kg
g

(2)

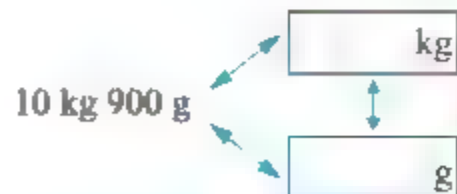


1 kg, 500 g, 200 g,  
100 g, 20 g,  
10 g, 5 g

kg
g



Express the weights in "kg," "g," and in both.

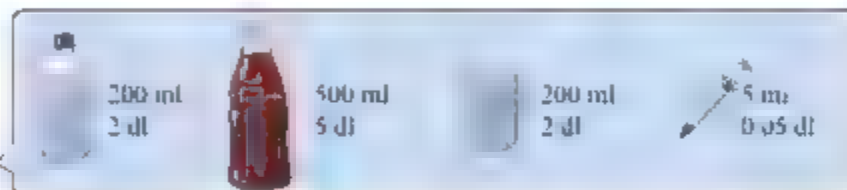


### 10.3 Volume of liquid



Let's learn a new unit of volume of liquid and use it

To weigh small amount of liquid, we use "deciliter (dl)" and "millilitre (ml)."



L (litre)	dl (deciliter)	ml (millilitre)
1 L	= 10 dl	= 1000 ml
	1 dl	= 100 ml

We also use 'cc' as a unit of volume of liquid

$$1 \text{ cc} = 1 \text{ ml}$$

(cc = cubic centimeter)



Kazol bought 1L of milk and drank 250 ml of it. How much milk is left?



1 L = 1000 ml  
So  
 $1000 - 250 = 750$   
**Answer: 750 ml**



250 ml = 0.25 L  
So  
 $1 - 0.25 = 0.75$   
**Answer: 0.75 L**

Both are correct. Dipika expresses it in **millilitre** and Arun expresses it in **litre**.

1 Express these volume in 'L,' 'ml,' in both and 'dl'.



## 10.4 Exercise (1)

1. Fill in the blank boxes.

(1) 8 mm =  cm

(4) 3 m 7 cm =  cm

(2) 4.2 km =  m

(5) 600 g =  kg

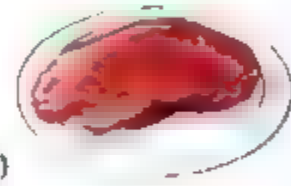
(3) 5.45 L =  ml =  dl

2. Length and width of the surface of Apu's desk are 62.5 cm and 45.6 cm. How long is the perimeter of the table? Express in "cm" and "m."



<input type="text"/> cm	<input type="text"/> m
-------------------------	------------------------

3. Hasan bought 1.5 kg of meat for his family. After they had eaten some of them, 895 g remained. How much meat did they eat? Express it in "kg" and "g."



<input type="text"/> kg	<input type="text"/> g
-------------------------	------------------------

4. Shampa drank 340 ml of water for breakfast, 380 ml for lunch, and 300 ml for dinner. How much water did she drink in total? Express in "ml", "dl" and "L."

<input type="text"/> ml	<input type="text"/> dl	<input type="text"/> L
-------------------------	-------------------------	------------------------

5. The distance from Arun's house to his uncle's is 9.8 km. He walks 950 m to the bus stop and travels 6.5 km on a bus. How far is left to reach his uncle's house? Express in "km" and "m."

<input type="text"/> km	<input type="text"/> m
-------------------------	------------------------

## 10.5 Area



Let's think about how to describe size of the surface.

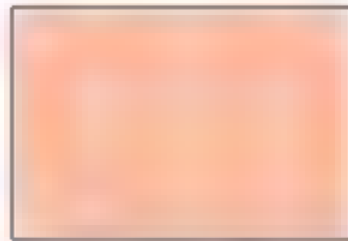


Which one is larger, A or B? How do you compare?

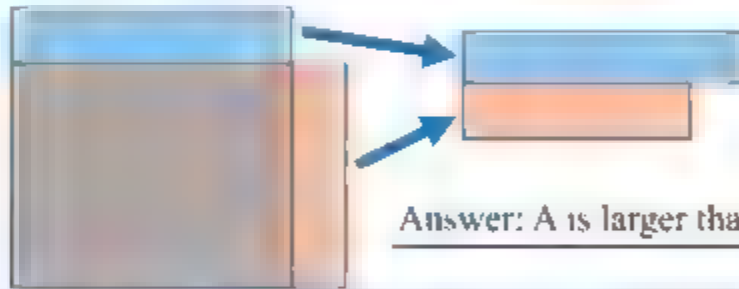
A



B



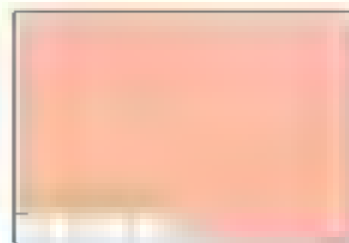
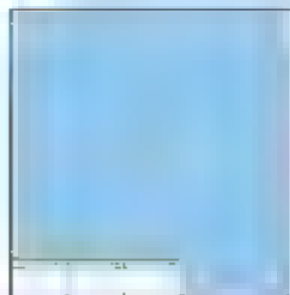
Um...the basic way is to cut them off or trace them on a piece of thin paper, then overlap them to compare



Answer: A is larger than B



If we cannot cut off or trace them, we can spread something on the surface and compare on the basis of the amount the object occupies



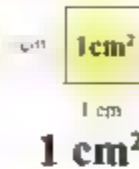
Yes, but I don't think "these" are enough. We need a specific unit of international standard.





The amount of space inside the boundary of a flat object is called "area". Area is expressed in terms of the **number of squares with 1 cm on each side**.

The area of square with 1 cm each side is called **1 square centimeter** and written as **1 cm<sup>2</sup>**. **cm<sup>2</sup>** is a unit of area.

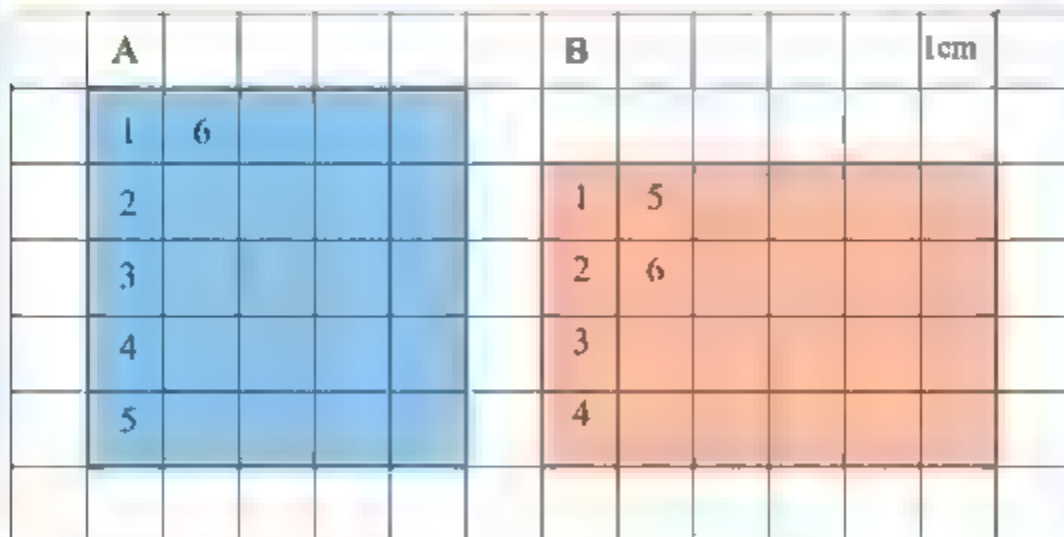


We can spread squares of 1 cm<sup>2</sup> on the surface and count the number to find the area.

Yes. But we can also think about it with the graph paper spacing of 1 cm × 1 cm.



Which one is larger, A or B? How many cm<sup>2</sup> is the difference?



The area of A is  1 cm<sup>2</sup>, so its area is  cm<sup>2</sup>.

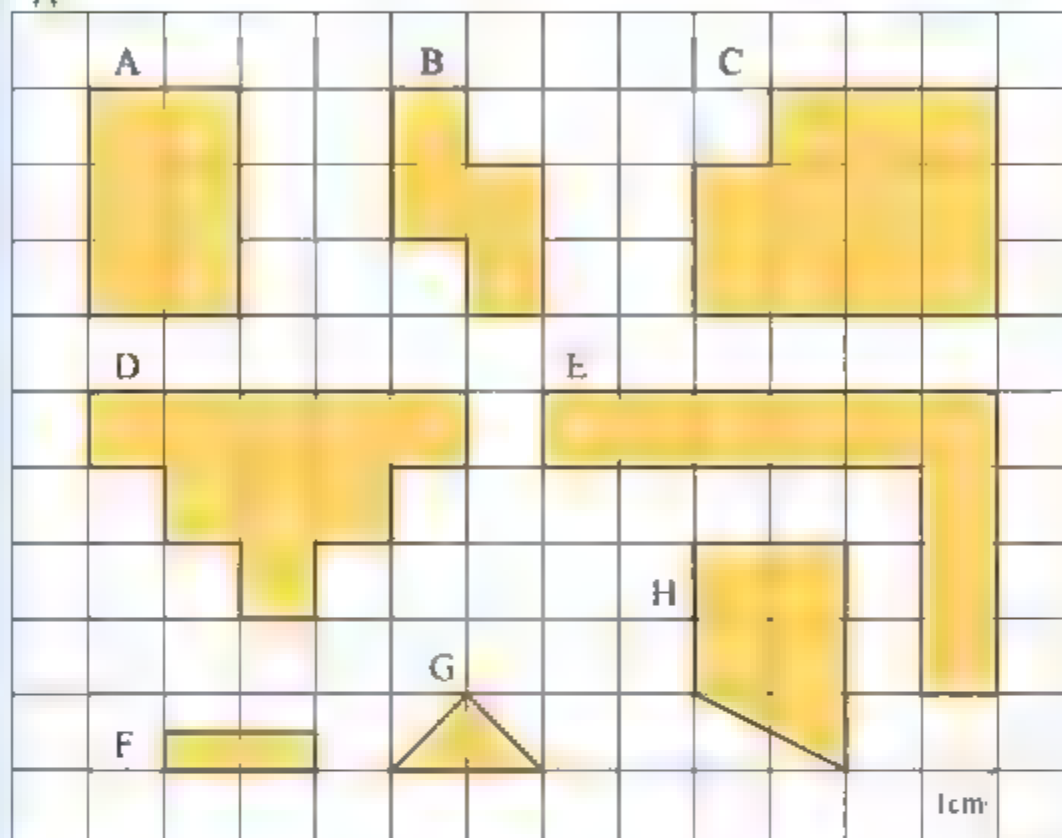
The area of B is  1 cm<sup>2</sup>, so its area is  cm<sup>2</sup>.

Answer:  is bigger than  by  cm<sup>2</sup>.

# Measurement



What is the area of each of the shapes below in  $\text{cm}^2$ ?



1cm

1cm



Draw freely various shapes with an area of  $8 \text{ cm}^2$ .

1cm



1cm

We count the number of squares of  $1\text{ cm}^2$  to figure out the area. So, I think the area can be estimated with some calculation



Think about how to find the area of following rectangle with calculation.



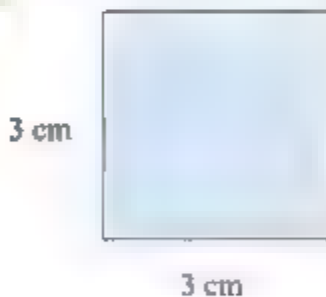
There are 4 columns of 3 squares stacked vertically



Mathematical sentence is  $\square \times \square = \square$  Answer is:  $\square \text{ cm}^2$



Find the area of following square with calculation



Mathematical sentence is \_\_\_\_\_

Area of the square is: \_\_\_\_\_  $\text{cm}^2$

The formulas for finding the area of rectangles and squares are below:

**Area of a rectangle = length  $\times$  width**

**Area of a square = 1 side  $\times$  1 side**

## Measurement

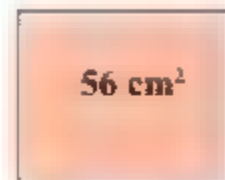


Find the area using the formula.

- (1) The rectangle of 21 cm long and 15 cm wide.
- (2) The square with 10 cm sides.



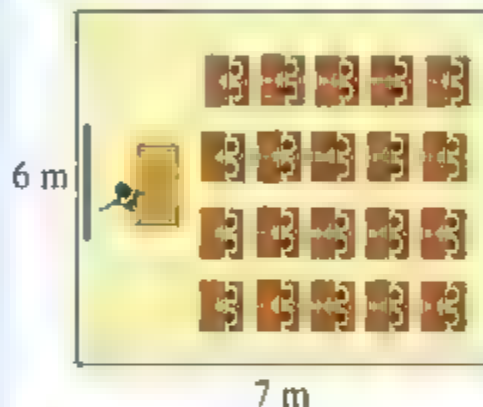
What is the width of the rectangle on the right?



8 cm



This is the size of Ripa's classroom. Find the area of the floor.



Let's use the formula. But before the calculation, we need to convert the unit.

$$6 \text{ m} = 600 \text{ cm}$$

$$7 \text{ m} = 700 \text{ cm}$$

$$\text{Area is: } 600 \times 700 = 420000$$

$$\text{Answer: } 420000 \text{ cm}^2$$

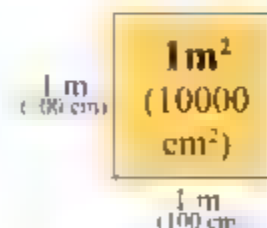
But the number is quite large.



Wow, great! You're right, and have mentioned good point, Reza!  
In this case, we can use another unit.



We can use the area of a square with 1 m sides.  
It is 1 square metre, and written as  $1 \text{ m}^2$ .  
 $\text{m}^2$  is a basic unit of area.



$$\text{Mathematical sentence: } 6 \times 7 = 42$$

$$\text{Answer: } 42 \text{ m}^2$$

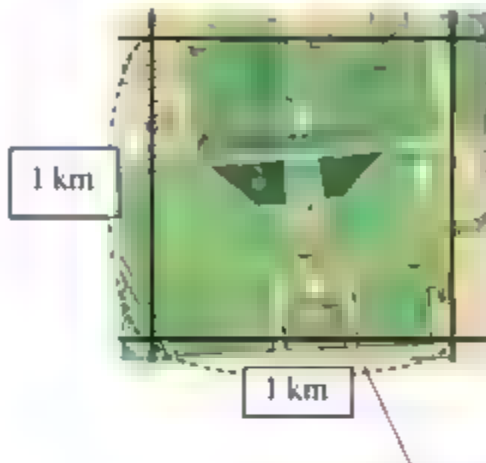
$$1 \text{ m}^2$$



As Reza found,  $42 \text{ m}^2 = 420000 \text{ cm}^2$   
Because  $1 \text{ m}^2 = 10000 \text{ cm}^2 (100 \text{ cm} \times 100 \text{ cm})$



This is the part of the map of the area near the National Parliament Building in Dhaka. One side of the square is 1 km.  
How do you express the area?



1 km  
(1000 m)

1 km<sup>2</sup>  
(1000000 m<sup>2</sup>)

1 km  
(1000 m)

1 km<sup>2</sup>



The unit used for large areas of land like towns and districts is the area of a square with 1 km sides.

It is **1 square kilometre**, and written as **1 km<sup>2</sup>**

- 3 ? A football field is rectangular in shape, and length of the longer side is 100 m and the width is 70 m. Find the area of the field.
- 4 ? Estimate the area of the rectangular piece of land that runs  
| 2 km east-west and 3 km north-south
- 5 ? Calculate the area of the square piece of land with 10 km sides

## 10.6 Exercise (2)

1. Find the area.

(1)

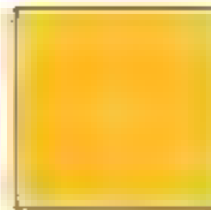
2 cm



4 cm

(2)

5 cm



5 cm

(3)

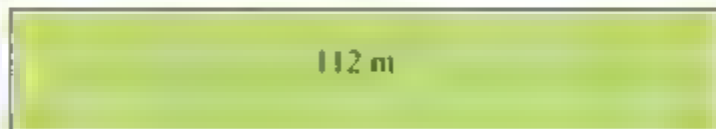
9 cm



2 cm

2. What is the length of the rectangular flowerbed below?

4 m



112 m

3. Find the area.

(1) A blackboard with 5 m length and 80 cm width.

(2) The surface of the rectangular table with a width of 150 cm and a width of 2 m.

(3) A rectangular piece of land that runs 2 km east-west and 500 m north-south.

4. Connect the dots.

(A) Area of a surface of the desk •

• 200 km<sup>2</sup>

(B) Area of a flowerbed •

• 2250 cm<sup>2</sup>

(C) Area of a town •

• 320 m<sup>2</sup>





## Chapter Eleven

# Time

### 11.1 Time



Let's convert the unit of time and add and subtract the time

Let's review relation among the unit of time.



year	month	week	day	hour	minute	second
1 year	12 months					
	1 month	4 weeks (or, 4 weeks and 2 or 3 days)				
		1 week	7 days			
			1 day	24 hours		
				1 hour	60 minutes	
					1 minute	60 seconds



Let's convert 1 hour, 1 day, and 1 week into seconds

1 minute is 60 seconds, so ..



- (1) 1 hour = 60 minute =  $60 \times 60$  second = 3600 second
- (2) 1 day = 24 hour =  $24 \times \underline{3600}$  second = 86400 second
- (3) 1 week = 7 day =  $7 \times \underline{86400}$  second = 604800 second



Convert day and week into minutes

1 hour is 60 minutes, so...



(1) 1 day = 24 hour =  minutes

(2) 1 week =  =  =  minutes

## Time



Express the following periods in hour.

(1) 3 day (2) 1 week

(3) 9 weeks and 6 days

1 day is 24 hours and  
1 week is 7 days, so .



$$(1) 3 \text{ days} = 3 \times 24 \text{ hours} = 72 \text{ hours}$$

72 hours

$$(2) 1 \text{ week} = 7 \text{ days} = 7 \times 24 \text{ hours} = 168 \text{ hours}$$

168 hours

$$\begin{aligned} (3) 9 \text{ weeks and } 6 \text{ days} &= 9 \times 7 \text{ days} + 6 \text{ days} \\ &= 63 \text{ days} + 6 \text{ days} \\ &= 69 \text{ days} \\ &= 69 \times 24 \text{ hours} \\ &= 1656 \text{ hours} \end{aligned}$$

1656 hours



Sajjad and Shohag are two brothers. The age of Sajjad is 14 years 5 months and the age of Shohag is 9 years 9 months. What is the difference between their ages?



As we find the difference, the operation should be

Why don't we subtract every unit? We first subtract smaller unit and then in order like calculation of integers



$$\begin{array}{r} \text{year} \quad \text{month} \\ \begin{array}{r} 14 \quad 5 \\ - 9 \quad 9 \\ \hline \end{array} \\ \begin{array}{r} 13 \quad 17 \\ - 9 \quad 9 \\ \hline \end{array} \\ \begin{array}{r} 4 \quad 8 \end{array} \end{array}$$

[month]

$5 - 9$ , but we cannot do it, so move 1 year (= 12 months) and subtract 9 from 17.

$$17 - 9 = 8$$

$$[\text{year}] \quad 13 - 9 = 4$$

The difference is: 4 years 8 months



As of September, 2014, world records of men's marathon and women's marathon are as follows.

men's marathon	2 02 57 (2 hours 2 minutes 57 seconds)
women's marathon	2 15 25 (2 hours 15 minutes 25 seconds)

(1) What's the difference between these two?



We can subtract every unit. We subtract smaller unit first and then in order



	hour	minute	second
	2	15 <sup>14</sup>	25 <sup>60</sup>
-	2	2	57
		12	28

[second]

$25 - 57$ , but we cannot do it, so move 1 minute (= 60 seconds) and subtract 57 from 85.

$$85 - 57 = 28$$

[minute]  $14 - 2 = 12$

[hour]  $2 - 2 = 0$

The difference is: 12 minutes 28 seconds

(2) How do we calculate if we need to add these two times?

	hour	minute	second
	2	2 <sup>1</sup>	57
+	2	15	25
	4	18	22

[second]

$57 + 25 = 82$ ,  
and  $82 = 60 + 22$ , so carry 1 minute.

[minute]  $2 + 15 + 1 = 18$

[hour]  $2 + 2 = 4$

The total is: 4 hour 18 minutes 22 seconds

## 11.2 Exercise

### 1. Express in seconds

2 minutes = 120 seconds

10 minutes =        seconds

4 minutes =        seconds

5 minutes =        seconds

12 minutes =        seconds

20 minutes =        seconds

### 2. Express in days.

48 hours = 2 days

2 weeks =        days

72 hours =        days

3 weeks =        days

120 hours =        days

4 weeks =        days

### 3 Add together and change them into hours and minutes

	minute	hour and minute
50 minutes + 30 minutes	80 minutes	1 hour and 20 minutes
35 minutes + 35 minutes		
60 minutes + 80 minutes		
90 minutes + 45 minutes		
120 minutes + 60 minutes		

### 4 Salma is 10 years 9 months old and the age of Mita is 12 years 0 months What is the difference between their ages?

### 5. Masuda Begum is entitled to get leave for 3 months 3 weeks 6 days. She took leave for 2 months 3 weeks 3 days. How many days' leave can she take more? (1 month = 30 days)



# Collection and Arrangement of Data

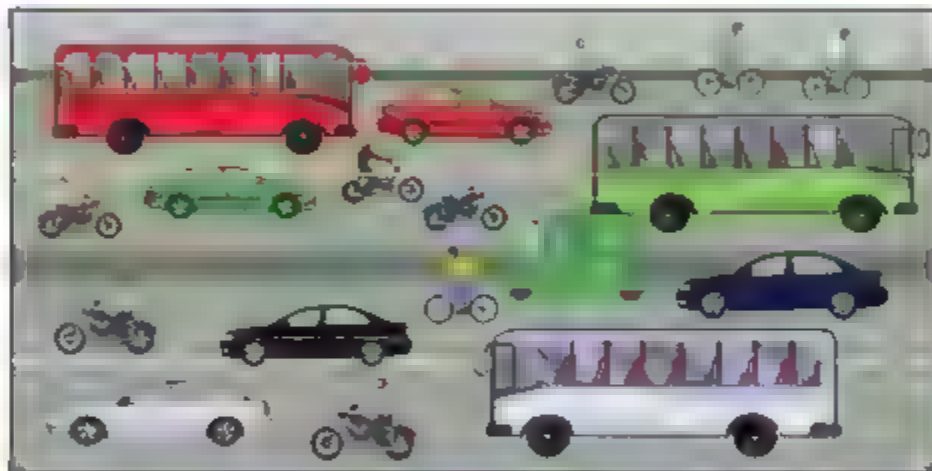
## 12.1 Making tables



Let's try to arrange the data on the table.



Let's think about how to count the number of the vehicles passing in front of us.

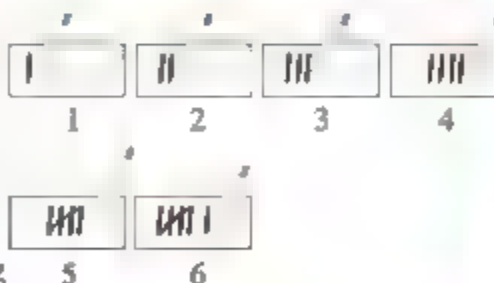


We need to make a record  
Otherwise we may forget the  
number.

Then let's use  
tally marks.



**Tally marks** are a quick way to keep track of numbers in groups of five. One vertical line is made for each of the first four numbers, but the fifth line is drawn across the previous four. Then we continue making single marks again. This is very easy to count by using **Tally marks**.



### Collection and Arrangement of Data



We would like to express the number of the vehicles on the table with tally marks. Let's complete the table on the right.

Name of vehicles	Tally marks
Bicycle	III
Standard vehicle	
Motor cycle	
Bus	
CNG	



Now let's convert tally marks into numeral characters to remake the table. And add the total number.

Name of vehicles	Number
Bicycle	3
Standard vehicle	
Motor cycle	
Bus	
CNG	
Total	

- (1) Which one of the vehicles is mostly used?
- (2) Which one of the vehicles is least used?

1. The teacher calls out the names of the fruits at random. Listen carefully and keep track of numbers with tally marks. And after that convert tally marks into numeral characters to complete the table below

Name of fruits	Tally marks	Number
Orange		
Banana		
Apple		
Guava		
Total		





## 12.2 Display with a Bar Diagram



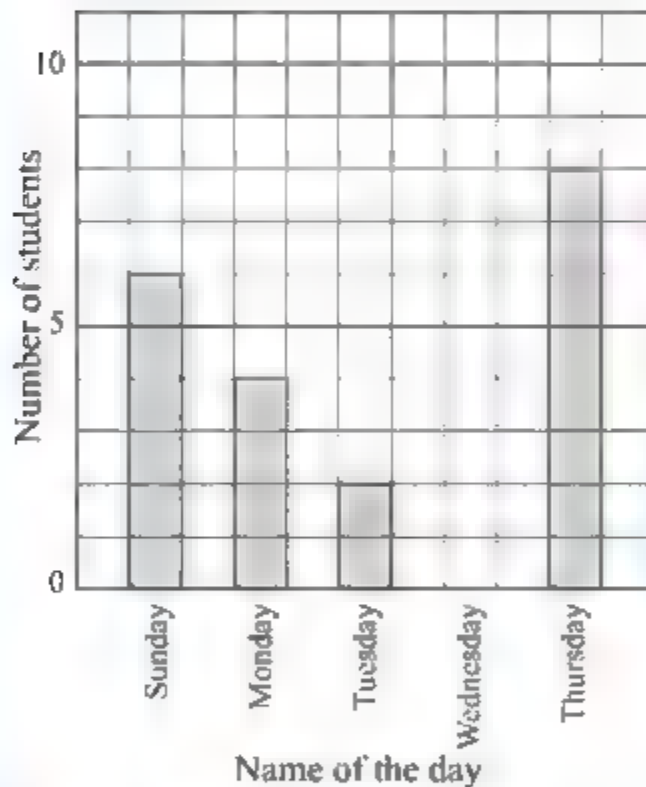
Let's try to display the data on a bar diagram



The number of absentees of class A in different days of the week is given in the table on the right and on the **bar diagram** below. Let's find how to read them.

Day	Number of absent students
Sunday	6
Monday	4
Tuesday	2
Wednesday	0
Thursday	8
Total	20

The number of absentees of class A



This is bar diagram.



Wow, bar diagram enables us to compare the size of numbers easily.



- (1) What is the title of the bar diagram?
- (2) How many students does one mark on the vertical scale represent?
- (3) On which day were most of the students absent?
- (4) On which day were all students present?

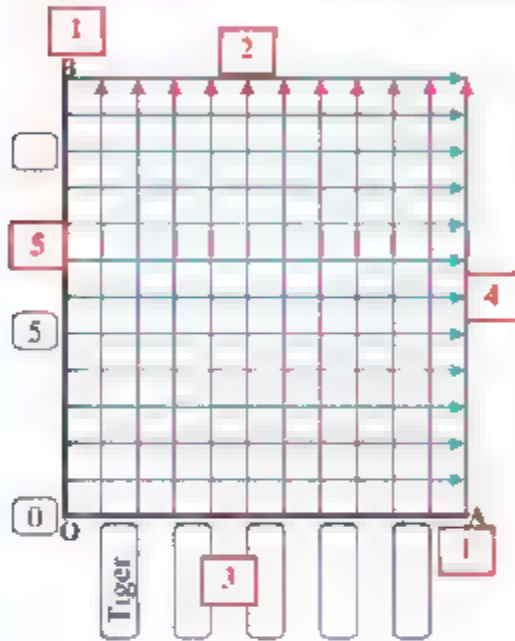
## Collection and Arrangement of Data



The table on the right shows the animals liked by Mita's classmates. Draw the bar diagram.

Animals	Number of students
Tiger	9
Elephant	11
Hippopotamus	4
Lion	7
Leopard	3
Total	34

### How to draw a bar diagram



**Step 1:** Draw a horizontal line OA and a vertical line OB.

**Step 2:** Draw some vertical lines on OA keeping equal space between them. The number of lines should be more than the number of animals.

**Step 3:** Write the name of the animals below between two vertical lines following the figure.

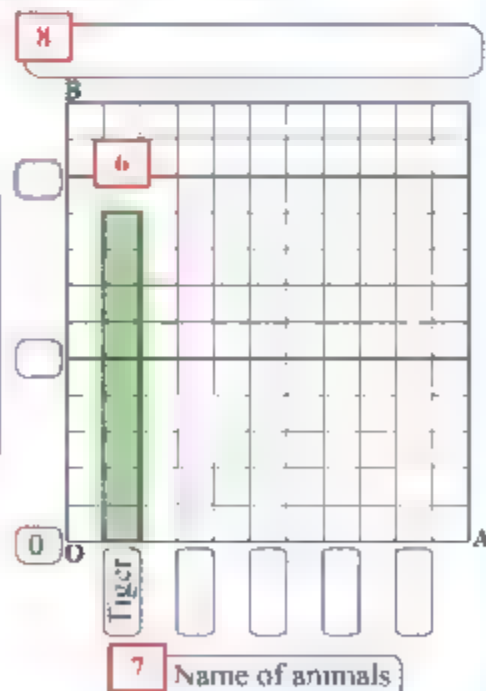
**Step 4:** Draw some horizontal lines on OB keeping equal space between them. The number of lines should be more than the number of students.

**Step 5:** Fix a scale for the number of student on OB (like 0, 5 and 10 students)

**Step 6:** Draw bars on OA for each animal according to the number of students' liking.

**Step 7:** Write title of horizontal axis as "name of animals" and vertical axis as "number of students"

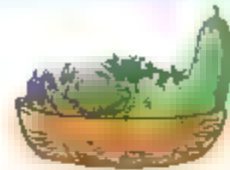
**Step 8:** Now write the title of the bar diagram as "Favourite animals of the student"



Let's complete the bar diagram.

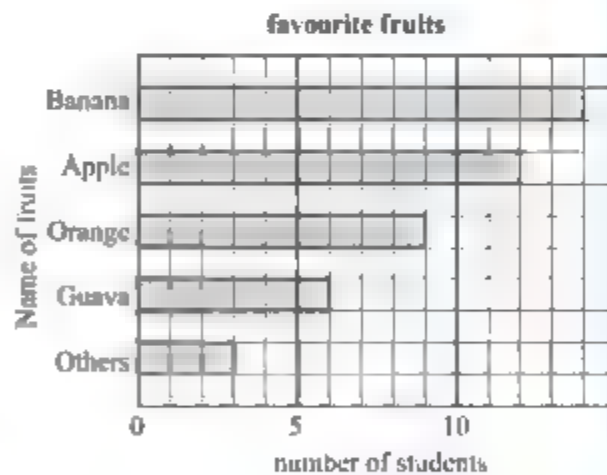
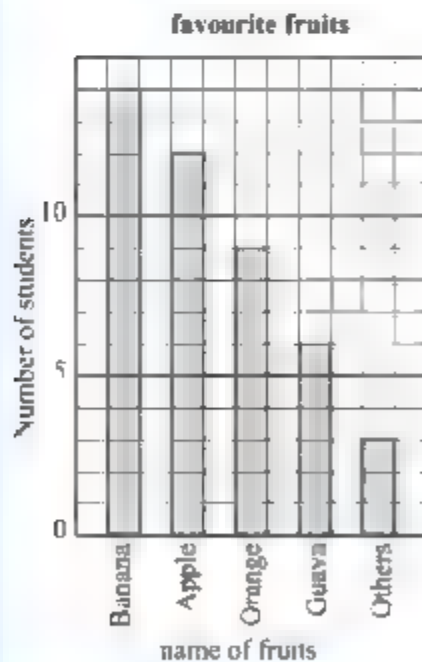
### 12.3 Exercise

1. This is the memo of the sales of various vegetables in a shop. Write the total amount of every vegetables in numeral characters.



Vegetables	Tally marks	Total
Lemon		
Cabbage		
Cauliflower		
Pumpkin		
Total		

2. Draw a bar diagram titled 'number of the vehicles' using the data in P.139
3. Compare these two diagrams. Can we say both of two are bar diagram? Talk freely with your friends and give your opinion



## Chapter Thirteen

# Lines and Angles

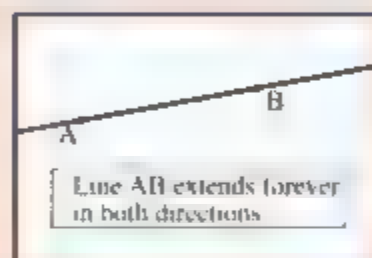
### 13.1 Lines



Let's learn about the lines and the relation among them.

A **straight line** is:

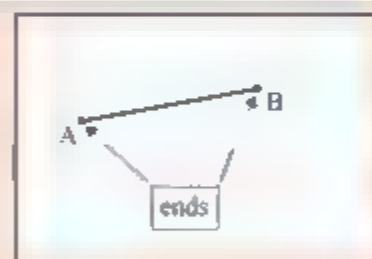
- Straight (no curves)
- Endless (extends in both directions without end)
- has no thickness



To show the endlessness we can draw a **straight line** like this:  $\longleftrightarrow$



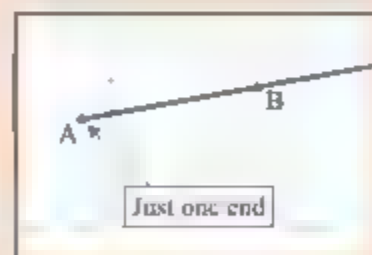
If it does have ends, it is:  
A **line segment**.



If it has just one end, it is.  
A **Ray**.



Just like a ray.

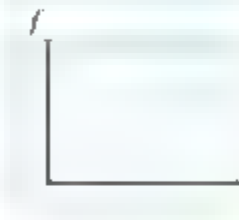
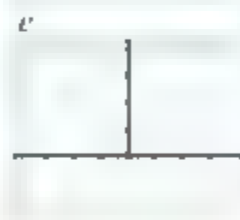
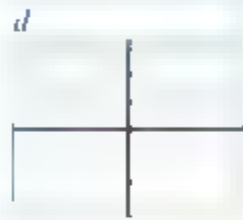


To show the endlessness of one side, we can draw a **ray** like this:  $\rightarrow$





Let's learn about how lines meet or intersect with each other



In the diagram *d*, *e* and *f*, lines meet or intersect at a **right angle**

We learned right angle in Grade 3



Right angle



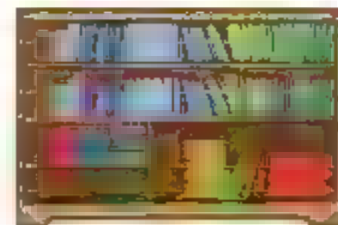
A line is **perpendicular** to another if it meets or intersects it at right angle.



The lines in the diagram *d*, *e*, and *f*, are **perpendicular** lines.

1

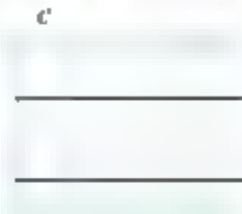
Look for perpendicular lines around you



## Lines and Angles

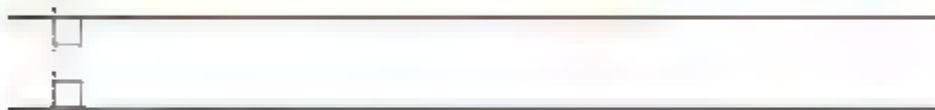
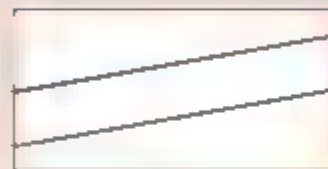


Are there any lines which don't meet or intersect with each other?



In the diagram *a* and *b*, two lines get closer to each other and they will intersect.

Lines are **parallel** if they are always the same distance apart and never meet.



In the diagram *c*, the lines are parallel. The **parallel** lines are both perpendicular to the same line, and no matter how far you extend them, they will never intersect.

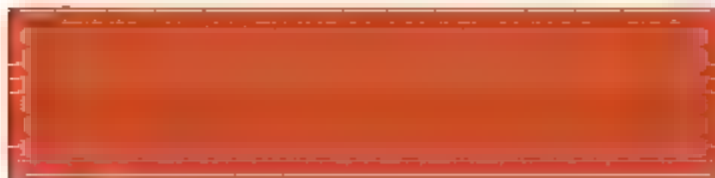


We can imagine two straight rail lines as a model of parallel lines.



1 ?

Look for parallel lines around you.

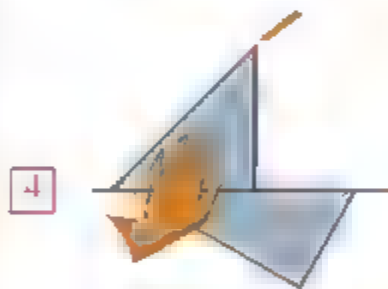
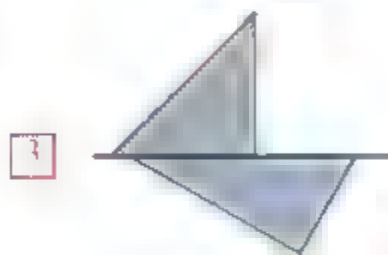




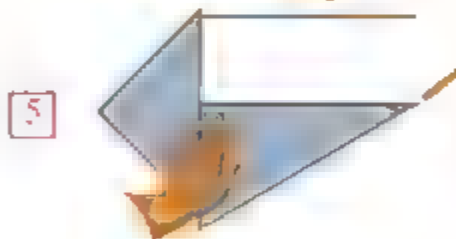
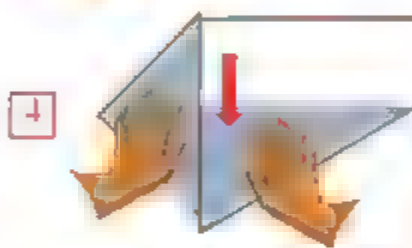
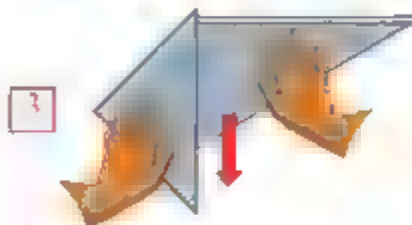


Let's draw **perpendicular** and **parallel** lines with set squares

**Perpendicular lines**



**Parallel lines**



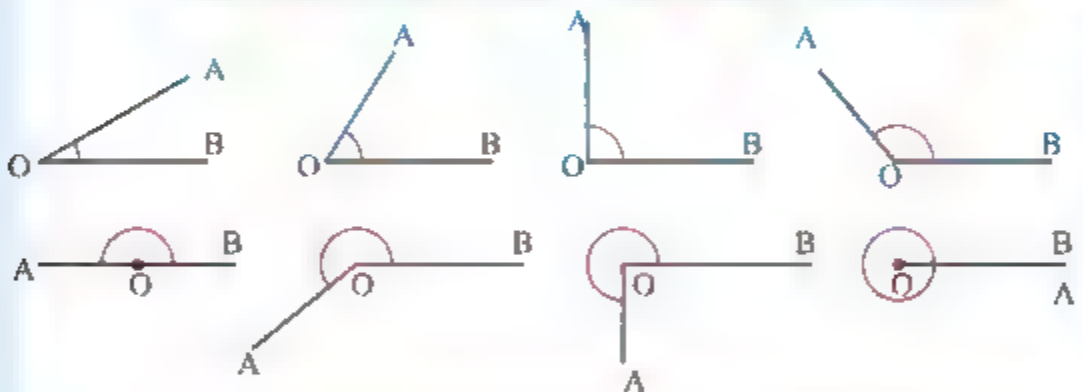
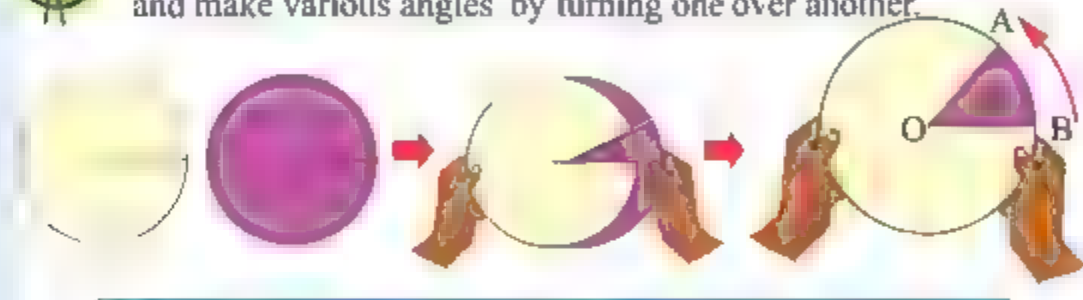
## 13.2 Angle



Let's find the size of the angles and draw them



Let's take two circles made of thick paper like the following and make various angles by turning one over another.



The size of the angle is not related to the length of the lines making the angle, but to the extent they are open

It would be convenient if we could express the size of angles by using numbers like length, area, volume and weight.



The unit for measuring the size of angles is **degree**, and  $^{\circ}$  is used to show it. The size of the angle indicates its measurement.

We use a **protractor** to measure the size of angles

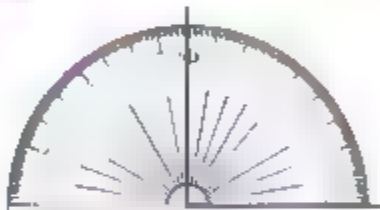


$1^\circ$  (1 degree)

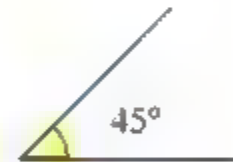
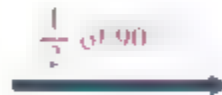
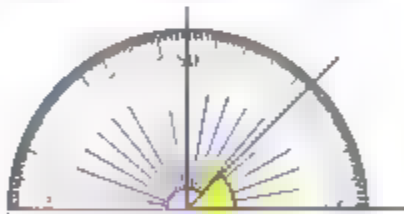
$1^\circ \times 90 = \text{right angle.}$   
**Right angle =  $90^\circ$**



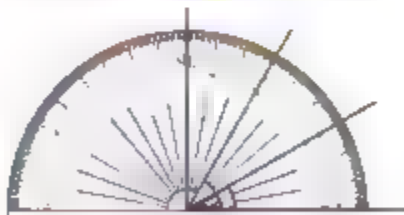
Let's observe some typical angles by dividing  $90^\circ$ .



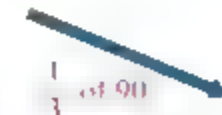
$90^\circ$  (Right angle)



$45^\circ$



$60^\circ$

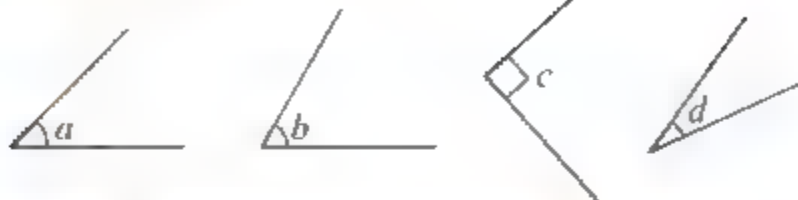


$30^\circ$

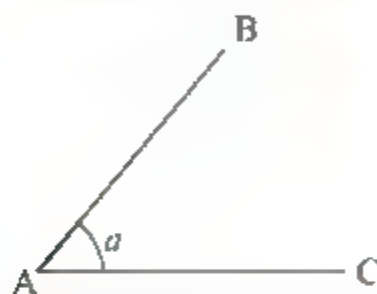
(These angles are  $90^\circ$ ,  $45^\circ$ ,  $60^\circ$  and  $30^\circ$ )

## Lines and Angles

- 1 Find  $30^\circ$ ,  $45^\circ$ ,  $60^\circ$  and  $90^\circ$ .

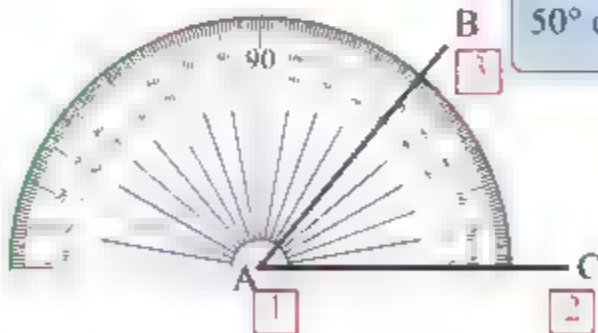


Now use a protractor to find the size of the angle  $a$



Angle  $a$  can be written as  $\angle a$ , or  $\angle BAC$  (read as angle CAB).

- 1 Place the central point of the protractor at vertex A.
- 2 Match the AB side with the  $0^\circ$  sign of the protractor.
- 3 Read the scale mark that mingles with the AC side.



Which scale do we use,  $50^\circ$  or  $130^\circ$ ?

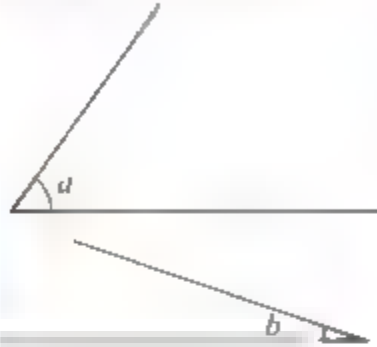


The size of angle of  $a$  is  $50^\circ$ . ( $\angle a = 50^\circ$  or  $\angle CAB = 50^\circ$ )

2 Measure the size of the angles.



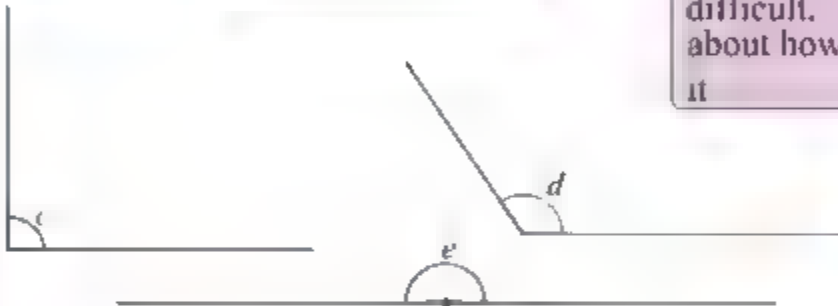
How do we measure b?



If the side of an angle is too short to measure, you can extend it.



I don't think it's so difficult. Let's think about how to measure it

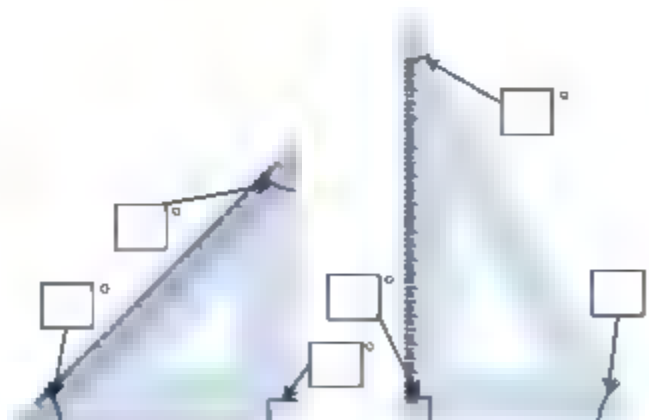


We can read degrees of the protractor from left to right as well.

$\angle e$  is  $180^\circ$ . It is called **straight angle**



Measure the size of the angles on a set square.



## Lines and Angles



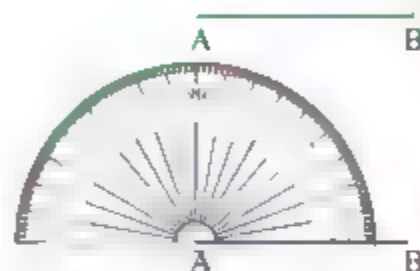
Draw an angle with a size of  $50^\circ$ .

Can we also use a protractor to draw angles?

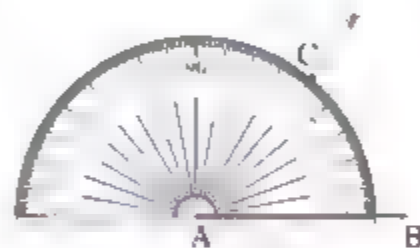


1 Draw a straight line AB.

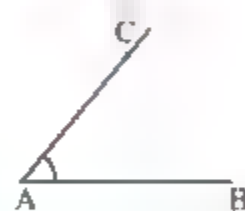
2 Place the central point of the protractor at the point A, and match line AB with the  $0^\circ$  line.



3 Draw a point C at the  $50^\circ$  scale mark.



4 Take the protractor away and draw a line with a ruler from the point A to the point C.



5  $\angle CAB$  is  $50^\circ$

3 Draw angles of the following sizes with a protractor

a  $30^\circ$

b  $75^\circ$

c  $90^\circ$

d  $135^\circ$





e  $180^\circ$



Now we can measure and draw angles.  
Let's learn more about angles.

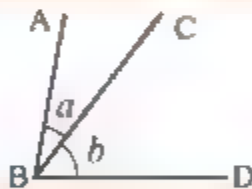


The angles can be classified as shown below:

angle	size	name
	smaller than $90^\circ$	acute angle
	$90^\circ$	right angle
	larger than $90^\circ$ and smaller than $180^\circ$	obtuse angle
	$180^\circ$	straight angle

The relation of angles can be expressed as shown below.

When two angles have a common side and a common vertex, and don't overlap, they are **adjacent angles**.



$\angle a$  and  $\angle b$  are **adjacent angles**.  
Because: They have the common side, BC.  
They have the common vertex, B.

When two angles add up to  $90^\circ$  (a right angle), they are **complementary angles**.



$\angle a$  and  $\angle b$  are **complementary angles**.  
Because: They add up to  $90^\circ$ .

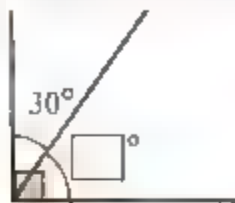
When two angles add up to  $180^\circ$  (a straight angle), they are called **supplementary angles**.



$\angle a$  and  $\angle b$  are **supplementary angles**.  
Because: They add up to  $180^\circ$ .

## Lines and Angles

4 Find hidden angles.



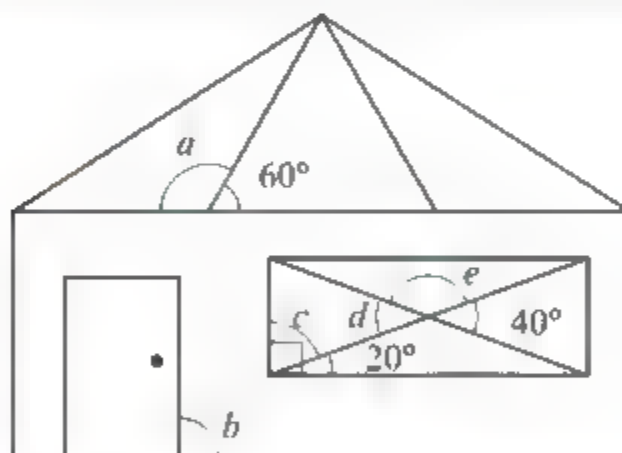
**Vertically opposite angles** are the angles opposite each other when two lines cross



$\angle a$  and  $\angle b$  are **vertically opposite angles**.  
The interesting thing is that vertically opposite angles are mutually equal.

$$\angle a = \angle b$$

5 Find  $\angle a$ ,  $\angle b$ ,  $\angle c$ ,  $\angle d$  and  $\angle e$  without measuring the angles



6 Identify the angle formed by the long hand and the short hand of the clock.

(1)



(2)



(3)



(4)



### 13.3 Exercise

1. Give names to the following angles.



2. Measure the following angles with a protractor.



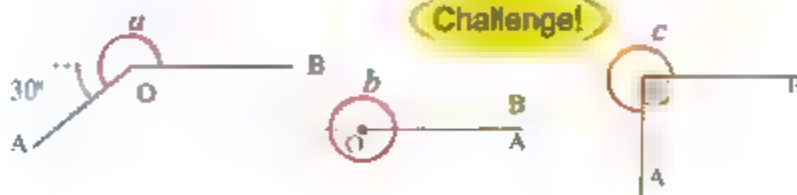
3. Draw following angles with a protractor.

(a)  $25^\circ$     (b)  $175^\circ$     (c)  $90^\circ$     (d)  $180^\circ$

4. Find the hidden angles.



5. Find the size of the following angles.



6. Explain what are **parallel** and **perpendicular** in words.

## Chapter Fourteen

# Triangle

### 14.1 Triangles



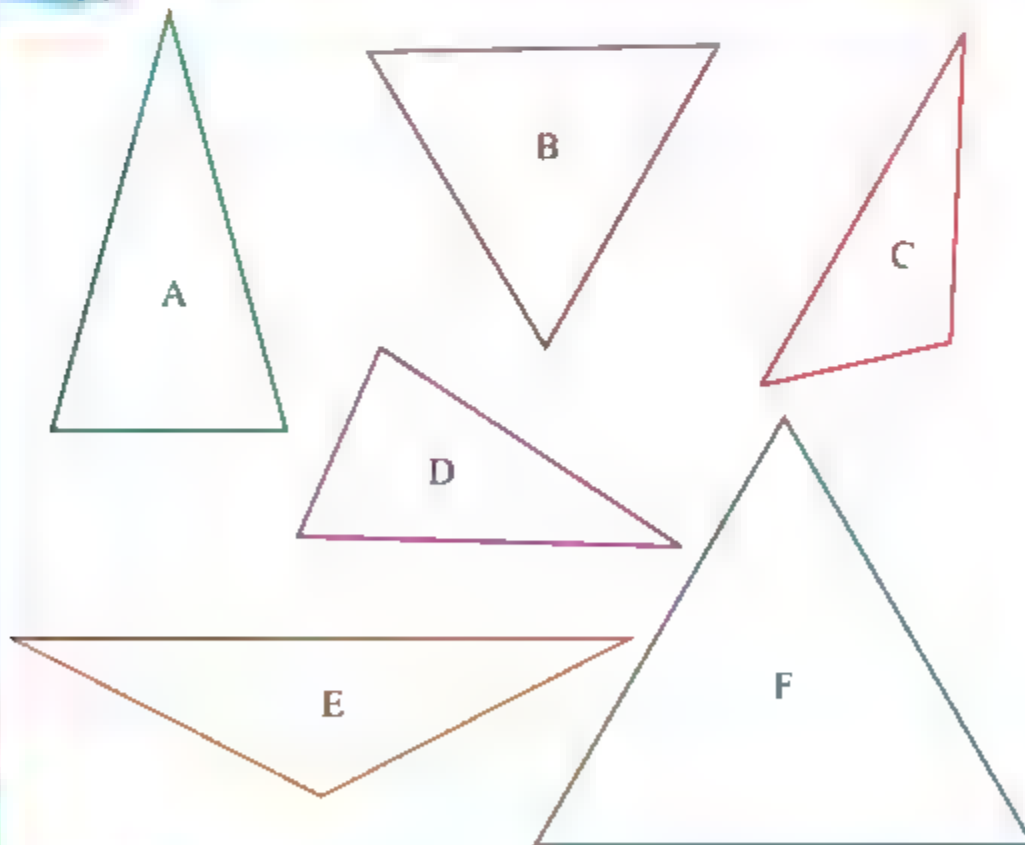
Let's learn the characteristics of triangles



Let's sort out the triangles according to the length of their sides.






By measuring the length of the sides with a ruler, estimate the characteristics of the triangles.



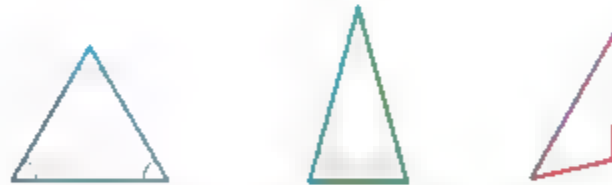
### Triangle based on the sides :

A triangle is given three names based on how many sides of that triangle are equal

Three equal sides		<b>Equilateral Triangle</b>
Two equal sides		<b>Isosceles Triangle</b>
No equal sides		<b>Scalene Triangle</b>



Using a protractor, let's measure the size of each angle of the triangles on the previous page.



**Equilateral Triangle** has three equal angles, and they are always  $60^\circ$ .

**Isosceles Triangle** has two equal angles.

**Scalene Triangle** has no equal angles.



Not only the length of the side but also the angles characterize triangles.

OK. Now let's try to draw triangles.



## Triangle

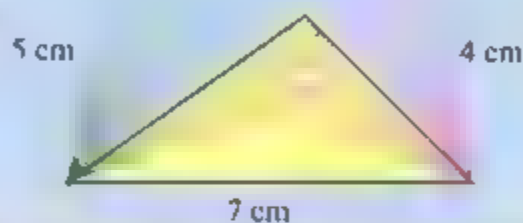


Draw a scalene triangle with the sides of 7cm, 5cm and 4cm.

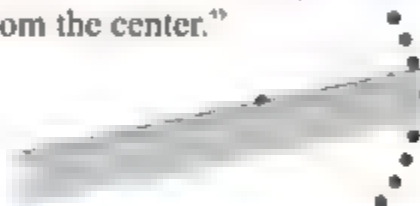
Let's begin with drawing 7cm side



OK. But how can we draw the second and third sides? Is there any good way to find the meeting point of these sides?

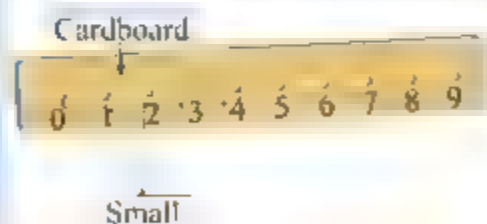


In the diagram above, the trace of the points of the sides is the same as a part of circles; in other words, "points which are located at the same distance from the center."



I remember we studied it in Grade 3

In order to draw a part of a circle, we can make a scaled rectangular piece of cardboard with small holes like below, instead of using a board pin and thread like the illustration above.



Now, let's draw the triangle.





1 Draw one side (the base of the triangle 7cm)



2 Draw 5 cm distance from the left side of the base.

3 Draw 4 cm distance from the right side of the base.

4 Draw two sides using the point you've found.

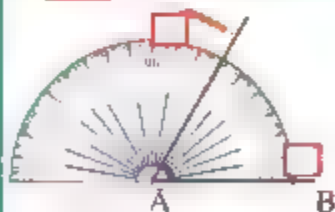
- 1 ? Draw the following triangles with the method above.
1. An equilateral triangle with sides of 6cm.
  2. An isosceles triangle with sides of 5cm, 7cm and 7cm.

**Equilateral Triangle** has three  $60^\circ$ , and **Isosceles Triangle** has two equal angles. Can we draw a triangle using these angles?

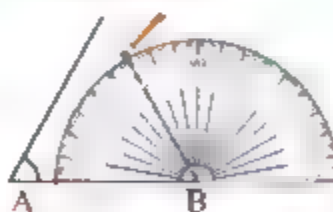


Draw an equilateral triangle with sides of 5cm.

1 Draw one side. (line AB 5cm)



2 Draw an angle with a size of  $60^\circ$  by the method on page 151.



3 Find  $60^\circ$  from B.

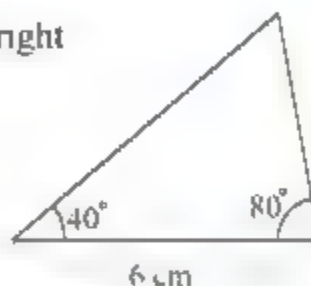


4 Draw a line and adjust the length of the sides.

## Triangle

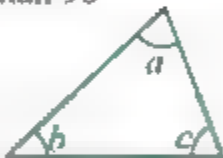
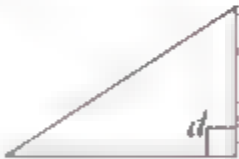

After drawing the equilateral triangle with sides of 5cm using the angles, make sure that the length of all the sides is the same and all the angles are  $60^\circ$ .


- 2  Draw the triangles as shown on the right



## Triangles based on the angles

Triangles can also be named based on their angles.

<p>All three angles are less than <math>90^\circ</math></p> <p><math>(a, b \text{ and } c &lt; 90^\circ)</math></p> 	<p><b>Acute Angled Triangle</b></p>
<p>One of the angles is <math>90^\circ</math></p> <p><math>(d = 90^\circ)</math></p> 	<p><b>Right Angled Triangle</b></p>
<p>One of the angles is greater than <math>90^\circ</math></p> <p><math>(e &gt; 90^\circ)</math></p> 	<p><b>Obtuse Angled Triangle</b></p>

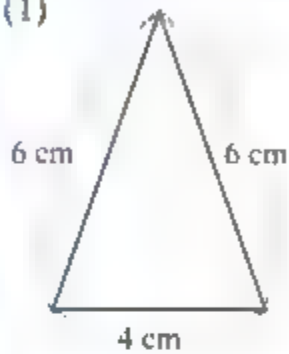
- 3  Are we able to draw an **Obtuse Angled Triangle** which has two obtuse angles? Let's explain the reason.



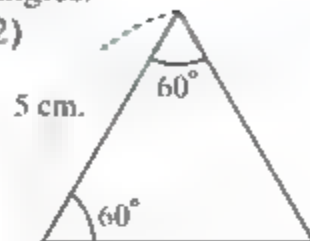
## 14.2 Exercise

1. Draw the following triangles.

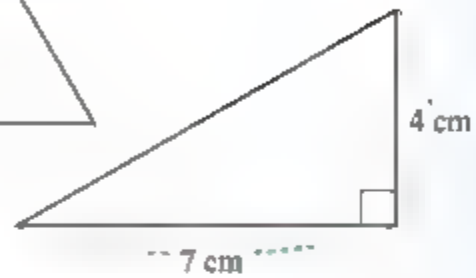
(1)



(2)



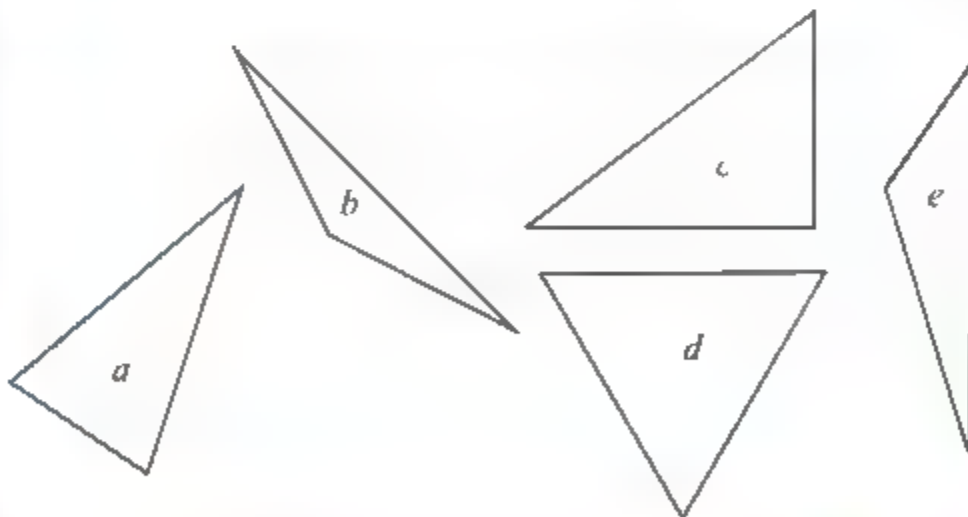
(3)



2. Answer the two kinds of names of the triangles above.

Classification	Triangle (1)	Triangle(2)	Triangle(3)
Based on the <b>sides</b>			
Based on the <b>angles</b>			

3. Group these triangles and talk about grouping in the classroom



## Answers

### Chapter 1:

#### Exercise-(1) Page-10

1. Do yourself 2. (1) 45,000, Forty five thousand (2) 1,00,00,000; One crore (3) 10,00,000, Ten lac (4) 1,27,000; One lac twenty seven thousand (5) 10,11,010, Ten lac eleven thousand and ten 3. Do yourself 4. (1) 1,35,24,689 (2) 97,57,834 (3) 5,55,55,555 5. (1) A. 1500 B. 3000 C. 4900 (2) A. 90,000 B. 93,000 C. 1,00,000 D. 1,07,000

#### Exercise-(2) Page-18

1. (1) < (2) > (3) < (4) < (5) (6) > 2. (1) 9,86,420 (2) 2,04,689 (3) 8,64,209 (4) 2,04,689 3. 371993-886397-2456891-3704231-4589476, highest population D. lowest population: A.

### Chapter 2:

#### Exercise- Page-32

1. (1) 68,889 (2) 80,194 (3) 73,921 (4) 90,000 (5) 69,989 (6) 80,420 (7) 83,094 (8) 96,006 (9) 3,810 (10) 34,518 (11) 60,909 (12) 1,607 (13) 80,306 (14) 5,894 (15) 22,222 (16) 99,991 2. (1) 55,101 (2) 1,240 3. (1) 10,000 (2) 2,426 (3) 28,500 4. 32,955 sacks 5. 2,043 6. 4,572 7. 8,126 8. 33,710 9. Gita 420 taka, Shihab 810 taka 10. 3,995 boys 11. 17,700 taka 12. 2,029 years old.

### Chapter 3:

#### Exercise- Page-42

1. (1) 7,520 (2) 1,000 (3) 45,300 (4) 10,000 (5) 3,770 (6) 63,272 (7) 35,280 (8) 64,960 (9) 31,668 (10) 6,240 (11) 31,784 (12) 98,472 (13) 65,626 (14) 98,331 (15) 88,803 (16) 62,321 (17) 43,010 (18) 86,328 (19) 83,804 (20) 87,969 2. (1) 15,616 (2) 19,278 (3) 18,240 (4) 49,500 (5) 1,57,800 (6) 2,46,000 3. (1) 91,200 (2) 91,200 (3) 9,12,000 4. (A) wrong- $143 \times 6$ ; right-  $143 \times 60$ ; right answer 8866 (B) 0 of multiplicand is not multiplied; right answer 74783 5. Do yourself. 6. 10,000 taka. 7. 18,500 tickets 8. 3,125 taka 9. 3,450 m 10. 1,980 taka 11. 50,875 taka 12. 74,490 pieces.

### Chapter 4

#### Exercise- Page-56

1. (1) 2 (2) 2 remainder 10 (3) 8 (4) 7 remainder 30 (5) 3 (6) 2

(7) 2 remainder 1 (8) 3 remainder 15 (9) 4 (10) 6 remainder 17 (11) 8  
 (12) 5 remainder 6 (13) 31 (14) 43 remainder 3 (15) 21 remainder 25  
 (16) 30 remainder 14 (17) 215 (18) 216 remainder 6 (19) 93  
 (20) 291 remainder 4 2. (1) 38 (2) 8 (3) 100 (4) 14 3. Do yourself.  
 4. 112 5. 9 groups 6. 7 postcards 7. 41 boxes, 8 pencils 8. 22 m  
 9. 27 taka 10. 28 garlands.

## Chapter 5

### Exercise- Page-65

1. (1) 53 (2) 35 (3) 25 (4) 7 2. (1) 824 (2) 524 (3) 66,000  
 (4) 9,200 (5) 800 (6) 776 3. (1) 108 taka (2) 146 (3) 3,000 taka  
 4. Moni 500 taka, Rupa 375 taka 5. father 44 years old, son 11 years old.  
 6. 96 taka 7. Do yourself.

## Chapter 6

### Exercise- Page-72

1. (1)  $>$  (2)  $=$  (3)  $=$  2. (1) true (2) true (3) false (4) false 3. (1)  $-$ ,  $\times$   
 (2)  $+$ ,  $-$  (3)  $\times$ ,  $+$  (4)  $-$ ,  $\times$  4. (1) 25 (2) 8 (3) 9 (4) 4  
 5. (1)  $\square \div 7 = 5$  remainder 4,  $\square = 39$  (2)  $7 \times (\square + 3) = 56$ ,  $\square = 5$

## Chapter 7:

### Exercise- Page-85

1. (1) 4, 8, 12 (2) 7, 14, 21 (3) 11, 22, 33 (4) 14, 28, 42 2. (1) 12, 24, 36;  
 LCM 12 (2) 36, 72, 108; LCM 36 (3) 9, 18, 27; LCM 9 (4) 40, 80, 120;  
 LCM 40 3. (1) 1, 3, 9 (2) 1, 2, 3, 4, 6, 12 (3) 1, 2, 3, 4, 6, 8, 12, 24  
 (4) 1, 2, 3, 5, 6, 10, 15, 30 4. (1) 1, 3 HCF:3 (2) 1, 7 HCF:7 (3) 1,  
 2, 4, 8, HCF:8 (4) 1 HCF:1 5. (1) LCM 24, HCF 4 (2) LCM 36, HCF 3  
 6. Do yourself 7. (1) 248, 460, 912, 810 (2) 339, 912, 555, 810, 951  
 (3) 515, 460, 555, 810, 725 8. 12:24 p.m. 9. 12 cm 10. 35 cm  
 11. 9 children; 5 apples, 2 oranges.

## Chapter 8:

### Exercise- (1) Page-94

1. (1)  $\frac{2}{3}$ ,  $\frac{5}{8}$ ,  $\frac{3}{9}$ ,  $\frac{42}{48}$ ,  $\frac{2}{25}$  (2)  $\frac{4}{4}$ ,  $\frac{1}{1}$ ,  $\frac{76}{76}$ ,  $\frac{3}{3}$   
 2. (1)  $\frac{2}{7} < \frac{3}{7} < \frac{6}{7} < \frac{7}{7}$  (2)  $\frac{4}{11} < \frac{4}{9} < \frac{4}{7} < \frac{4}{5}$  (3)  $\frac{11}{91} < \frac{11}{23} < \frac{11}{17} < \frac{11}{13}$



## Answers

3. (1) 2 (2) 12 (3) 27 (4) 15 (5) 72 (6) 48 (7) 1 (8) 3  
(9) 7 (10) 2 (11) 13 (12) 9

4. (1)  $\frac{1}{2}$  (2)  $\frac{1}{7}$  (3)  $\frac{1}{4}$  (4)  $\frac{1}{3}$  (5)  $\frac{2}{3}$  (6)  $\frac{3}{4}$  (7)  $\frac{4}{5}$  (8)  $\frac{8}{9}$  (9)  $\frac{3}{5}$   
(10)  $\frac{4}{7}$  (11)  $\frac{4}{7}$  (12)  $\frac{3}{5}$

### Exercise- (2) Page-101

1. (1)  $>$  (2)  $<$  (3)  $>$  (4)  $=$  (5)  $>$  2. (1)  $\frac{3}{4}$  (2)  $\frac{29}{35}$  (3)  $\frac{13}{24}$  (4)  $\frac{16}{21}$  (5)  $\frac{23}{36}$   
(6)  $\frac{14}{15}$  (7)  $\frac{4}{5}$  (8)  $\frac{3}{10}$  (9)  $\frac{2}{3}$  (10)  $\frac{3}{4}$  3. (1)  $\frac{1}{12}$  (2)  $\frac{13}{30}$  (3)  $\frac{1}{6}$  (4)  $\frac{5}{18}$   
(5)  $\frac{5}{36}$  (6)  $\frac{1}{2}$  (7)  $\frac{1}{3}$  (8)  $\frac{1}{10}$  (9)  $\frac{1}{5}$  (10)  $\frac{1}{15}$  4. (1)  $\frac{2}{3}$  (2)  $\frac{13}{18}$  (3)  $\frac{1}{18}$   
(4)  $\frac{13}{20}$  5. (1) 2 (2) 1 (3) 2 6. (1)  $\frac{19}{24}$  km (2) Sabuj's;  $\frac{1}{24}$  km  
7. (1)  $\frac{19}{20}$  part (2)  $\frac{1}{20}$  part.

## Chapter 9:

### Exercise- (1) Page-110

1. (1)  $<$  (2)  $<$  (3)  $>$  (4)  $>$  (5)  $=$  (6)  $>$  (7)  $=$  (8)  $=$  2. (1) 1 (2) 1.3 (3) 1.3  
(4) 2 (5) 0.3 (6) 0.8 (7) 0.9 (8) 1.6 3. (1) 4.8 (2) 4.3 (3) 8.6 (4) 9.8 (5) 8  
(6) 2.1 (7) 2.2 (8) 6 (9) 0.8 (10) 0.2 4. (1) 17.2 km (2) 0.8 km

### Exercise- (2) Page-120

1. Do yourself 2. (1) 31 (2) 296 (3) 1,047 (4) 1,030 3. (1) 6, 0.06  
(2) 4.9, 0.049 (3) 11.1, 0.111 (4) 73.2, 0.732 4. (1) 4.81 (2) 8.08 (3) 7.8  
(4) 3.21 (5) 4 (6) 3.19 (7) 7.95 (8) 1.83 (9) 8.58 (10) 1.07 5. (1) 0.12  
(2) 0.34 (3) 0.75 (4)  $\frac{3}{5}$  (5)  $\frac{1}{4}$  (6)  $\frac{3}{40}$  6.  $3.68^{\circ}\text{C}$  7. (1) 5,301 (2) 0.135



**Chapter 10:****Exercise- (1) Page-126**

1. (1) 0.8 cm (2) 4,200 m (3) 5,450 ml, 54.5 dl (4) 307 cm (5) 0.6 kg  
 2. 216.2 cm, 2.162 m 3. 0.605 kg, 605 g 4. 1,020 ml, 10.2 dl and 1.02 L  
 5. 2.35 km and 2350 m.

**Exercise- (2) Page-133**

1. (1)  $8 \text{ cm}^2$  (2)  $25 \text{ cm}^2$  (3)  $18 \text{ cm}^2$  2. 28 m. 3. (1)  $40,000 \text{ cm}^2$  (2)  $30,000 \text{ cm}^2$   
 (3)  $10,00,000 \text{ m}^2 (=1\text{km}^2)$  4. (A)  $2250 \text{ cm}^2$  (B)  $320 \text{ m}^2$  (C)  $200 \text{ km}^2$

**Chapter 11:****Exercise- Page-137**

1. 4 min. = 240 (seconds) 12 min. = 720 (seconds) 10 min. = 600 (seconds)  
 5 min. = 300 (seconds) 20min. = 1200 (seconds) 2. 72 hours = 3 (days)  
 120 hours = 5 (days) 2 weeks = 14 (days) 3 weeks = 21(days) 4 weeks  
 = 28 (days) 3. 70 minutes/1 hour and 10 minutes, 140 minutes/2 hours  
 and 20 minutes, 135 minutes/2 hours and 15 minutes, 180 minutes/3  
 hours 4. 1 year 3 months 5. 1 month 3 days.

**Chapter 12:****Exercise- Page-142**

1. 48, 27, 35, 14 2-3. Do yourself.

**Chapter 13:****Exercise- Page-154**

1. a. obtuse angle b. right angle c. straight angle d. acute angle  
 2.  $a=15^\circ$   $b=107^\circ$  3. Do yourself. 4.  $55^\circ$ ,  $135^\circ/45^\circ/135^\circ$  5. a.  $210^\circ$   
 b.  $360^\circ$  c.  $270^\circ$  6. Do yourself.

**Chapter 14:****Exercise- Page-160**

1. Do yourself 2. Triangle (1) isosceles, acute; Triangle (2) equilateral,  
 acute; Triangle (3) scalene, right angled 3. Do yourself

Academic Year 2025, Class Four–Math

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